January 1982

RADio COMmunication

RSGB REGIONAL REPRESENTATIVES CONFERENCE
17 October 1981

The 1981 RSGB President with Council members, regional representatives and RSGB staff who attended the conference

Standing, l to r: W. Ricalton, G4ADD, RR18; A. W. Hutchinson, editor; J. C. B. Rider, G4FLQ, membership services officer; B. H. Green, GW8AA, RR11; W. J. Colclough, G3XC, RR9; P. J. Walker, G8HMG, RR7; H. G. Cunningham, G8FG, RR17; H. S. Pinchin, G3VPE, RR3 (now Council member); E. J. Allaway, G3FKM, Council member; L. Hawkyard, G5HD, Council member; J. H. Nelson, G4FRX, assistant to general manager; P. F. D. Cornish, G3COR, hon treasurer; J. T. Barnes, GI3USS, RR15; A. B. Givens, GM3YOR, RR13; W. R. Parkinson, G3FNM, RR1; F. S. G. Rose, G2DRT, RR6; B. L. Goddard, G4FRG, RR20; F. Hall, GM8BZX, RR12 (now Council member); R. J. Broadbent, G3AAJ, RR19; K. A. Crouch, G8KEN, RR8; D. S. Smith, G4DAX, RR2

Seated, l to r: W. J. McClintock, G3VPK, Council member; R. G. Barrett, GW8HEZ, Council member; J. Anthony, G3KQF, executive vice-President (1982 President); B. O'Brien, G2AMV, 1981 President; D. A. Evans, G3OUF, general manager; D. S. Evans, G3RPE, Council member; I. J. Kyle, GI8AYZ, Council member: Mrs J. Heathershaw, G4CHH, Council member. Not shown, but also present: M. Shardlow, G3SZJ, RR4

Journal of the Radio Society of Great Britain

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It's been a long time coming but now with the availability of the Expander-430 you can purchase a complete station for VHF/UHF all modes at a very attractive price. In one small package you have the complete freedom of the VHF/UHF bands at the touch of a button. No awkward cables to plug and unplug, instant band change at the touch of a single control. In fact you have all the advantages of a more expensive base station while retaining the versatility of a unit that can be both mobile and fixed.

Let's consider in more detail what the combination provides. Firstly, you have the luxury of adding the Expander to your M750E and doing on 70cms exactly what you have been able to do with the M750E alone on 2m. That means USB/LSB/CW FM with full digital readout down to 100Hz with full signal strength and RF output metering. Secondly, band switching is done at the press of a button. Aerial selection is carried out automatically so there is instant changeover from 70cms to 2 metres. In fact its even possible to transmit on one band and receive on another—sorry, no "listen through" though! The correct repeater shift is automatically taken care of inside the M750E and because a very low level of drive is employed, there is no leakage on 2 metres when operating on 70cms. Full coverage of 430-440MHz is possible with the EXPANDER at either 10W or 1W output and, of course the dual VFO system can be used on both 2 metres and 70cms.

In short, if you're a VHF/UHF man then the M750E and EXPANDER unit will provide a complete and comprehensive station for either fixed or mobile use. To complete your station, there is the matching AC power supply model PS750.

FDK MULTI 700EX

NUMBER ONE FM MOBILE

£199 inc VAT

The Multi 700EX now a firm favourite with amateurs throughout the world—it embodies all the essential features of a completely self-contained FM station. Its punchy 25 watt signal beats all the old 10 watt transceivers hands down. The large digital display gives clear and precise frequency readout, controlled by a "click stop" frequency selector knob that provides steps of 25kHz with an additional 12½kHz selector.

Priority scanning provides for the scanning of pre-programmed channels plus the mains dial channel. Repeater operation is taken care of by means of a 600kHz down shift selector and automatic tone burst switch. For listening on the input frequency of the repeater, instant reverse repeater operation is available at the touch of a button. Local contacts are taken care of by a continuously variable power control that enables power to be reduced right down to 1 watt.

2m MONITOR

FDK TM 56B

THE PROFESSIONAL ONE

£89 inc VAT & free delivery

Still going strong, the TM56B monitor is one of the very few units available that really does perform every bit as good as a transceiver. Used by amateur and commercial users who demand reliability and sensitivity; it has both 230V and 12V dc supplies built-in together with internal speaker. It features up to 12 crystal controlled channels plus four autoscan with individual channel lockout. For amateur use we supply it with ten popular channels (including all repeaters) and for marine use nine popular channels. If you want a serious monitor then look no further.

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143-148·995MHz

FREE CREDIT

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FEATURES

- ★ Multi-scanning. Scan and search of memories and of entire band.
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- ★ Only 6mA drain for optional continuous display.
- ★ Programmable scan steps in multiples of 5kHz.
- ★ Completely integrated keyboard.
- ★ 600kHz repeater shift with auto tone-burst.
- ★ External speaker/mic socket.

JANUARY 1982

VOLUME 58 No 1

RADio COMmunication

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EDITOR
A. W. Hutchinson

Assistant editor
Miss S. M. Walker

Draughtsman
D. E. Cole

Editorial secretary
Miss H. Samuel

Contributions **(including Members' ads)** and all correspondence concerning the **content** of *Radio Communication* should be addressed to:

The Editor, RSGB,
88 Broomfield Road,
Chelmsford,
Essex CM1 1SS

Tel 0245 84938

Office hours: 0900 to 1700

ADVERTISING

Advertising, other than Members' ads, should be sent to:

Mr C. C. Lindsay,
2 Leyburn Gardens,
Croydon,
Surrey CR0 5NL

Tel 01-686 5839 *(Not RSGB)*

Hours: 0915 to 1715

EDITORIAL CONSULTANT

J. P. Hawker, G3VA

Correspondence concerning the distribution of the journal and all other Society matters should be addressed to:

RSGB Headquarters,
35 Doughty St,
London WC1N 2AE

Tel 01-837 8688

Business hours: 1000 to 1600

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All articles received are reviewed for technical merit by the RSGB Technical & Publications Committee, or an acknowledged expert on the subject, before acceptance. Payment will be made for all articles published.

The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

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TRIO *pacesetter in amateur radio*

We've handled a lot of equipment in our time as radio amateurs but the TS830S really took us by storm. As you will hear if you listen on the air, it's reputation is high all round the world. We think the TS830S is exactly right for the operator who has carefully considered all the features necessary for top performance, put aside all the gimmickry and found the TS830S. This rig offers you all band coverage; true frequency readout on all modes; variable bandwidth *and* passband tuning; rugged, reliable 6146B valves in the PA; top quaity both in construction and design; and, above all, the Trio reputation for giving you the best equipment at a reasonable price. Thousands of happy users worldwide all confirm that if you want total satisfaction, try the TS830S. Send for comprehensive details today.

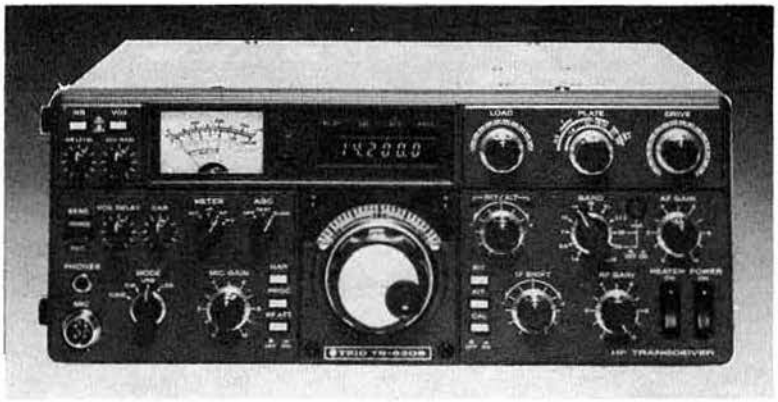
TS-830S

£694.83 inc VAT. Securicor £4.50

A recent addition to the Trio HF range, and proving amazingly popular is the new TS530S. Designed as a "little brother" to the TS830S, the TS530 uses the same PLL system, same RF boards, same readout system and many other features of the 830 but without the variable bandwidth facility. You do, of course, have the famous Trio IF shift system for dodging the QRM.

We really believe that the TS530 is the finest mid-price HF base station transceiver on the market and we would like the opportunity to prove it to you. Why not call us, or call in person to see and try out this super rig.

If you like to read lists of features, how about 160-10 metres including new bands: passband tuning on all modes: 6146B PA tubes for low intermod: low power tune up: digital readout shows *true* frequency at all times: VOX built in: CW sidetone: speech processor: noise blanker: etc, etc.



TS-530S

£534.98 inc VAT. Securicor £4.80

For the keen mobile/portable enthusiast, the "no-tune" solid state transceiver has proved irresistible, and the Trio TS130S is probably the best of the bunch. When the original TS120 was introduced, there were gasps of amazement at Trio's achievement in making a first class HF rig in such a small size. With the advent of the TS130S, the mobile rig really comes to maturity. Imagine an 8 band transceiver with digital readout, I.F. shift, vox, speech processor, single conversion PLL derived transmitter and receiver, 100W output, red hot receiver—and all in a package you can carry on the palm of one hand. It's really a staggering thought.

The unquestioned excellence of Trio design and manufacture shows in every aspect of the TS130S—why not see it and try it for yourself.

TS-130S

£525.09 inc VAT. TS130V £445 inc VAT

The compact DFC230 Digital Frequency Controller provides maximum efficiency and flexibility for mobile and fixed operation by combining a 20Hz step digital VFO with 4 memories. ● 20Hz step digital VFO. ● Four memories: Frequency can be transferred from VFO to memory or from memory to VFO. ● Built-in digital display: Shows digital VFO or memory frequency. ● Perfect for mobile installation. ● UP/DOWN manual scan: Frequency can be shifted with UP/DOWN microphone (supplied with DFC-230) or with FAST STEP switch on front panel. ● Cross-operation switch: Allows split-frequency operation, with transceiver VFO on transmit and DFC-230 (VFO or memory) on receive, or vice versa. ● RIT (receiver incremental tuning). ● RIT, VFO, and MEMO indicators: LEDs show functions in operation. ● Compatibility with TS-830S, TS-120S/V and TS-130S/V.

DFC-230 *digital frequency controller*

£179.86 inc VAT. Securicor carriage £4.80

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278 PENTONVILLE ROAD, LONDON N1 9NR (LOWER SALES FLOOR, HEPWORTH'S SHOP)

TRIO *pacesetter in amateur radio*

TR-9000 *2 metre multi mode mobile or base station*

SP-120 TR-9000 BO-9 PS-20

The TR-9000 combines the convenience of FM with long distance SSB and CW. It is extremely compact . . . perfect for mobile operation. Matching accessories are available for optimum fixed-station operation.

TR-9000 FEATURES:

- FM, USB, LSB, and CW.
- Two digital VFOs, with selectable tuning steps of 100Hz, 12·5kHz, and 25kHz.
- Digital frequency display. Five, four or three digits, depending on selected tuning step.
- Covers 144·000 to 146·000MHz.
- Band scan . . . automatic busy stop and free scan.
- SSB/CW search of selectable 9·9kHz bandwidth segments.
- Five memories . . . four for simplex or +600kHz repeater offsets and the fifth for a non-standard offset (memorizes transmit and receive frequency independently).
- UP/DOWN microphone (standard) for manual band scan.
- Noise blanker for SSB and CW.
- RIT (receiver incremental tuning) for SSB and CW.
- RF gain control.
- CW sidetone
- Selectable RF power outputs . . . 10W (H1)/1 W (LO).
- Mobile mounting bracket with quick-release levers.
- LED indicators . . . ON AIR, BUSY, and VFO.

OPTIONAL ACCESSORIES

- PS-20 fixed-station power supply.
- SP-120 fixed-station external speaker.
- BO-9 System Base . . . with power switch, SEND/RECEIVE switch (for CW), memory-backup power supply and headphone jack.

TR9000 **£374.90** inc VAT
Securicor carriage **£4.50**

TR-9500 *70cm FM, SSB and CW multimode mobile*

The TR9500 a 70cm multimode mobile giving SSB, FM and CW operation in a compact rig based on the phenomenally successful 2 metre 9000. Combining the convenience of FM with the "DX ability" of SSB on the 70cm band this is the rig all discerning VHF and UHF amateurs have been waiting for. Used alongside your existing 2 metre equipment a new spectrum of contacts becomes available. Repeaters, satellite working, simplex and with the addition of your 2 metre rig Duplex communications are at your fingertips.

Of course the matching accessories, SP120 speaker, BO-9 system base and PS20 power supply, are all available to enable you to build a base station system second to none.

The TR9500 features:

- FM, USB, ESB and CW.
- Similar in size to the TR9000.
- Two digital VFOs.
- Multiple scan facilities for various modes.
- Six memories, five for simplex or repeater shift – and the sixth memory for a non-standard offset.
- Digital frequency display.
- Covers 430 to 440MHz.
- Up/down microphone for manual band scan.
- RIT (Receiver Incremental Tuning) for SSB and CW.
- RF gain control.
- Mobile mounting bracket.
- Led indicators for on air and busy.

Optional Accessories.

- PS20 fixed station power supply.
- SP120 fixed station external speaker.
- BO9 system base – with power switch, send/receive switch, memory back up power supply and headphone jack.

TR 9500 **£449.88** inc VAT
Carriage £4.50

NEW

APPROVED TRIO DEALER

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Leeds LE2 3AG
0532 452657

TRIO

As the appointed distributors for Trio, we recommend that you purchase your Trio equipment from an approved stockist (list above). Any stockist *not* on the list has no connection with the Trio UK sales and service organisation and cannot, despite claims to the contrary, offer any meaningful guarantee of backup service on Trio equipment.

TRIO *pacesetter in amateur radio*

The R-100 is an amazing easy-to-operate, high performance, communications receiver, covering 200kHz to 30MHz in 30 bands. This PLL synthesized receiver features a digital frequency display and analog dial, plus a quartz digital clock and timer.

R-1000 FEATURES:

- Covers 200kHz to 30MHz continuously.
- 30 bands each 1MHz wide.
- Five-digit frequency display with 1kHz resolution and analog dial with precise gear dial mechanism.
- Built-in 12-hour quartz digital clock with timer to turn on radio for scheduled listening or control a recorder through remote terminal.
- Step attenuator to prevent overload.
- Three IF filters for optimum AM, SSB, CW. 12kHz and 6kHz (adaptable to 6kHz and 2·7kHz) for AM wide and narrow, and 2·7kHz filter for high-quality SSB (USB and LSB) and CW reception.
- Effective noise blanker.
- Terminal for external tape recorder.
- Tone control.
- Built-in 4in speaker.
- Dimmer switch to control intensity of S-meter and other panel lights and digital display.
- Wire antenna terminals for 200kHz to 2MHz and 2MHz to 30MHz. Coax terminal for 2MHz to 30MHz.

R1000 £297.85 inc VAT.
Securicor carriage £4.50

With more features than ever before available in an amateur band receiver. This triple-conversion (8·83MHz, 455kHz, and 50kHz IFs) receiver, covering all amateur bands from 160 through 10 metres, as well as several shortwave broadcast bands, features digital as well as analog frequency readouts, notch filter, IF shift, variable bandwidth tuning, sharp IF filters, noise blanker, stepped RF attenuator, 25kHz calibrator, and many other features, providing more operating conveniences than any other receiver.

- FREQUENCY COVERAGE
  Frequency range:
  160 metres (1·8-2·0MHz
  80 metres (3·5-4·0MHz)
  40 metres (7·0-7·5MHz)
  20 metres (14·0-14·5MHz)
  15 metres (21·0-21·5MHz)
  10 metres (28·0-28·5MHz)
  10 metres (28·5-29·0MHz)
  10 metres (29·0-29·5MHz)
  10 metres (29·5-30·0MHz)
  19 metres (15·0(wwv)-15·5MHz)
  49 metres (5·9-6·4MHz)
  31 metres (9·4-9·9MHz)
  25 metres (11·5-12·0MHz)
  16 metres (17·7-18·2MHz)
  Auxiliary band.
- VBT/SELECTIVITY CONTROLS
  Separate controls on the same shaft provide variable bandwith tuning as well as selection of four IF filters: IF SHIFT varies (shifts) IF passband away from interfering signal.
- RIT/NOTCH CONTROLS RIT allows receiver to be tuned off frequency, while not affecting transmit frequency, when in transceive mode. Notch control tunes notch within IF passband for eliminating interference. Notch frequency remains the same, even when IF shift is utilized.

R820

£589.95 inc VAT. Securicor carriage £4.50

HC10 world clock
£58.88 inc VAT

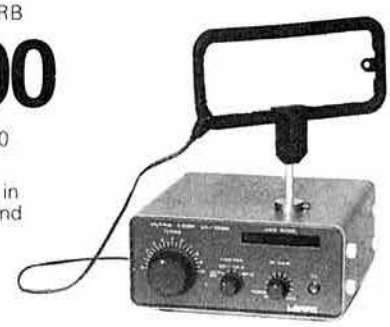
HS4 £10.35 inc VAT

HS5 £21.85 inc VAT

NOT FROM TRIO BUT SUPERB

UL-1000

£39.50 inc VAT. Carriage £2.00



The UL-1000 is a new concept in receiving station accessories and will help any keen listener to improve the performance of his station, particularly in the difficult conditions existing in the medium wave band (500kHz-1·6MHz).

The UL-100 is a self-contained variable gain, tuned preamplifier suitable for use with various aerial systems. A particular feature of the UL-1000 is the use of a high Q loop aerial for the 500kHz-1·6MHz band.

LOWE ELECTRONICS Ltd
CHESTERFIELD ROAD MATLOCK DE4 5LE TEL 0629 2430/2817

EMPORIUM NEWS

Hello there Another page of Emporium News.

Alan has just told me that enquiries for the **UL1000** have increased tremendously since I mentioned it in last month's Emporium News – I am not surprised because it has to be the **finest thing** that has been made **for the keen shortwave listener.** The directional and hence nulling properties of the **high Q loop antenna** really have to be experienced for you to see what a superb piece of equipment this is.

Regarding **the Trio range of equipment,** I am sure those of you who visited Donington Park for the Amateur Radio Exhibition noticed the three new pieces of equipment. If you were not able to attend I will briefly do my best to describe them.

The new 70 cm and 2 metre dual band rig from Trio, the TS780, amazed all who saw it – the 780 is destined to become a winner. Covering the full **10 MHz** of the **70 cm band** and **2 MHz** of the **2 metre band,** the 780 is a first class rig. Just consider the following: **IF shift** which will certainly improve listening facilities on the now busy 2 metre band – **an additional 2 memories** making a total of ten which can be easily selected and programmed by a rotary switch, the **ability to scan** either the **2 metre or 70 cm frequencies** in the memory, **or both,** the **possibility of scanning** either 0·5MHz, 1MHz, 3MHz, 5MHz or 10MHz in 5 or 12·5KHz steps – just the thing to prevent your FM getting fed up with SSB. **Automatic repeater shift** both on 70 cms and 2 metres, **reverse repeater** and last, but not least, a VFO knob which when the mode switch is in **FM channel position** gives a 12·5KHz click stop feel to the VFO. So for side band operation use the VFO in its free-running position, and for that final tune, the braked position and for looking over the FM channels, the click stop position.

I am sure those of you with 770s have cursed when you sit down in front of the rig after a hard day at work to find that during the day the wife has switched off the electricity supply at the distribution board to change a light bulb and the entire content of the memory is lost. OK so you could have the separate battery pack but on the TS780 all you need do is lift the access panel, fit three small cells and the memories are retained for ever – no, that is an over-statement, for a long time. **So that is the TS780.** I am a TS770 man and the TS780 is destined to become part of my equipment.

If you hanker after an R1000 but cannot just quite come up with the £297·85 required, then you will be pleased to know that Trio have brought out **the R600** which is the R1000 without the clock and stepped attenuation facility. Many people were fascinated with this new receiver and again we are sure it is going to be a winner. Rumour has it that the TS780 may be cheaper than the TS770E and, of course, the R600 is less than the R1000.

Regarding the R1000, we have read with keen interest the review in a recent issue of **"Radio and Electronics World"** Magazine – never heard of it, you had better get a copy quickly. Back to the story, the review compares the two most interesting receivers to come out of Japan in the last decade. One is the pace-setting R1000, the other is the FRG770. If you really want to appreciate **the achievement of Trio designers** when they produced the R1000 read this review. Few people have even taken the trouble to really look at the electronics package inside the R1000 but it really is **an amazing receiver,** outperforming other equipment which, up to its introduction, were hailed as the best. **The R1000 represents high technology,** tailored to the user's requirements. No gimmicks, no fancy digital electronics, just performance at a sensible price. The review uses the word **'elegant'** to describe many aspects of the R1000 design and that really sums it up.

Since I mentioned the **AOR 740 70 cm FM hand held,** many of you have found out how good a piece of gear this is and I am certain that the 70cm repeaters in your area **make a pleasant change** from the now often crowded 2 metre ones.

Joking apart, have you had a look at the latest RSGB listing of repeaters? Without a doubt there must be a 70cm repeater just for you located in your own backyard.

I do not know whether you have read the advert on the opposite page regarding **the R820 general coverage receiver** but it is well worth studying. An exceptionally fine piece of equipment giving all the sophistications of a very expensive piece of equipment **at the new Lowe price of £589.95.** Absolutely superb for listening to the amateur bands and with that **Trio** knack they have provided it with just the right set of shortwave broadcast bands that make it ideal for **an evening excursion** around the world **courtesy of the shortwave radio stations.**

We now have in stock – though by the time you read this the situation may have changed – **the NSD515 amateur transmitter** which couples so perfectly with the receiver that the only way to get the feel of this calibre of equipment is to come along to Matlock and see it for yourself. It will be necessary for you to make an appointment as it is likely, due to tremendous demand, that the only NRD515/NSD515 combination for you to look at is in my shack. **My wife** says that as long as you remove your shoes before climbing the stairs to enter my shack then **the discerning of you** are welcome.

John Wilson has just tapped me on the shoulder and asked for the following to be incorporated in "Emporium News". **You all know our John,** topical to the last, and the following are his thoughts:

"Whilst musing upon our company image, the thought came to me that there are two approaches to selling technical products, one I shall call **'the blunt instrument',** the other the **'sharp blade'.** The blunt instrument company has all its weight up front – you must have experienced it; the showroom staffed by **sharp-eyed men,** all exactly 6 feet tall, slight suntan, gold identity chain on wrist, immaculate suit slightly nipped in at the waist, and descending on you from all directions urging you to buy something. This instrument is blunt because behind the forward weight, the company tapers to nothing. **No service, no spares, no advice, no knowledge, no experience and no hope** for the customer.

I hope that our approach is the 'sharp blade'. Up front you will find David in the showroom, usually on his own, honed to a fine edge, full of good advice and a desire to help. Behind this fine edge, however, you have the weight of the company based firmly on SERVICE. Now employing 23 people, most of whom are licensed radio amateurs, **and most of whom are engaged in customer back-up,** we believe that in these days of the more discerning customer, only we can give you the support you should reasonably expect in a technical hobby.

The blunt instrument may induce you to buy a **gimmick-laden rig** in a cardboard box but it's the sharp blade that cuts through the nonsense and gives you good advice, a friendly welcome and that all important backup.

Think about it."

As one of the guys at the sharp end I wholeheartedly agree with his comments and this is exactly what I, as the ad. man, have been trying to explain during the past months.

If you have a **Lowe Card** I am sure you are delighted with the very special offers which accompanied your last statement. However, if the information has not yet arrived then please ring us for full details.

For those of you who think I cannot count, there was **a third new Trio rig – the TR2500 2 metre hand-held** – which should now be in stock.

Anyway, that's about it for now as I have just heard an office rumour that **Trevor, our Accountant,** has run off with the profits and we are all invited to a party at his house tonight! So, until next month, gud DXes, 73es, FBOM, etc.

ICOM

The State of the Art in '82

IC–25E The Tiny Tiger 25W FM Mobile.

ICOM have got everything right with its new 25W FM mobile. It is one of the smallest around and yet is packed with features which make it really handy to use while still maintaining the very high quality expected in ICOM transceivers.

Like its bigger multimode brother, the IC-25 has TWO VFOs FIVE MEMORIES (which can be used in either simplex or duplex mode) a PRIORITY CHANNEL (which can be any one of the frequencies stored in the memories) full DUPLEX and REVERSE DUPLEX operation and a crystal controlled tone burst. Again the display is brighter and there is an LED Bar-type S-Meter and relative power output meter. The choice of frequency steps is 25kHz and 5kHz. Like the IC-290 multi-scanning functions are available either from the front panel or remotely using the HM-10 scanning microphone.

Again we feel that this beautifully designed and constructed piece of equipment is bound to sell like hot cakes – and again remember that if you buy one directly from Thanet you will get a full two years' warranty and any work will be carried out in our excellently equipped workshop. One of our engineers has been out to ICOM in Japan for a two week course to learn the tricks of the trade.

All this and yet its not much bigger than a car radio!

BUY DIRECT FROM US AND GET TWO YEARS WARRANTY ON ALL EQUIPMENT AND BENEFIT FROM OUR SUPERB TECHNICAL EXPERIENCE AND AFTER-SALES SERVICE.

IC–290E The Ideal Multimode Mobile

The IC-290E incorporates all the features you could want in a multi-mode mobile to make it easy to use when driving. A standard 600kHz repeater offset shift is built into its computer's memory but if necessary this can be altered from the front panel for unusual shifts that may be required (such as say 1.6MHz for some transvertors). There are five programmable memories and these can be used in either simplex or duplex mode. Any one of these memories can also be designated as a PRIORITY CHANNEL which can be checked once every five seconds if you wish for that private message you may be expecting. Scanning can be controlled either from the front panel or from the HM10 microphone. There are options to scan the whole band, any selected part of it, or just the memory channels. You do NOT lose the repeater shift when scanning or using either of the VFO's in simplex. Unlike many of its competitors you do have TWO VFO's which can also prove a very useful feature. Further improvements include a brighter frequency readout, an LED bar-type S-Meter and power output meter and the ideal tuning rates of 25kHz per step on FM and 100Hz per step on SSB. Both these rates can be changed to 1kHz steps by use of the TS button on the front panel. For repeater operation both + and − shifts are available and it is possible to listen on the repeater input channel merely by pressing a button. Internal controls allow you to vary scan speed scan delay times etc., Semi break-in CW, and CW sidetone are also available.

Put all these features into an attractive case, add the world wide renowned ICOM quality and performance, and you must see that this is the choice for you. And just as an extra remember, you get a full two years warrenty if you purchase your transceiver direct from THANET or one of our agents listed in this advertisement.

Thanet Electronics

ICOM

143 RECULVER RD., BELTINGE, HERNE BAY, KENT. Tel: 02273 63859

IC–720A **The Best for H.F.**

The main problem that the amateur of today has to deal with is deciding just which rig out of the many excellent products available he is going to choose. Technology is advancing at such a rapid rate and getting so sophisticated that many cannot hope to keep up! Perhaps one way of dealing with the problem is to look at just what each model offers in its basic form without having to lay out even more hard earned cash on "extras". The IC-720A scores very highly when looked at in this light.

Here are some of the features:-

- Two VFO's with automatic band changing
- General coverage receiver 100 kHz to 30 MHz (with provision to transmit if you have a licence!)
- No PA tuning
- Protection against rotten antennas
- Self cancelling RIT
- Full power capability (even on RTTY) for prolonged periods.
- Automatic control of linear and antenna tuner

IC–730 **The Best for Mobile.**

ICOM's answer to your HF mobile problems – the IC-730. This new 80m–10m, 8 band transceiver offers 100W output on SSB, AM and CW. Outstanding receiver performance is achieved by an up-conversion system using a high IF of 39MHz offering excellent image and IF interference rejection, high sensitivity and above all, wide dynamic range. Built in Pass Band Shift allows you to continuously adjust the centre frequency of the IF pass band virtually eliminating close channel interference. Dual VFO's with 10Hz, 100Hz and 1kHz steps allows effortless tuning and what's more a memory is provided for one channel per hand. Further convenience circuits are provided such as Noise Blanker, Vox, CW Monitor APC and SWR Detector to name a few.

A built in Speech Processor boosts talk power on transmit and a switchtable RF Pre-Amp is a boon on todays crowded bands. Full metering, WWV reception and connections for transverter and linear control almost completes the IC-730's impressive facilities.

IC–2KL **Super Linear**

To compliment the excellent IC-720A HF Transceiver, ICOM have produced the IC-2KL linear amplifier. It is of a similar size and matches the IC-720A perfectly. It produces 500W output on SSB, CW, AM, and RTTY needing 80-100W of drive. As with the IC-720A, it will operate from 1.6MHz to 30 MHz continuously at full output power, but you still need an antenna that matches! It will follow the IC-720A automatically changing bands WITH NO TUNING – the operating is done from the prime mover.

This automatic facility can be overridden for use on rigs other than the IC-720A, but can be added to the IC-701 and the IC-730. The IC-2KL employs a heat pipe cooling system for the heatsink of the power transistors. This is a new technology used to transfer the heat, has a high conductance, several hundred times that of copper and a very quick response.

The IC-2KL has a matching power supply the IC-2KLPS delivering 40vDC at 25A continuous for 10 minutes maximum.

IC–202S (2m) **SSB Portables.** IC–402 (70cm)

The IC-202S is a very well designed 2m SSB portable. It offers 3W pep output on USB, LSB and CW. Large Battery capacity (HP11 type) or Nicads if you wish. A special VXO circuit to provide smooth tuning and crystal stability needed for SSB operation on 2m. Each of the four 200k Hz band positions allows operation anywhere in 2m (Supplied with 144-144.2 and 144.2-144.4) Top of the band Oscar xtals available for cross-pond working. It has a DC socket and SO239 sockets for mobile or base station working barefoot or as a prime mover. Mobile mounting brackets Nicad packs, chargers: cases all available options. You must agree a very versatile well proved rig. The 70cm twin of the 202S has very similar features covering the frequency range of 432-435.2 MHz. Their versatility is well worth an enquiry.

IC–24G **Low Priced Mobile**

The famous IC-24O has been improved given a face lift and renamed the IC-24G. Many thousands of 240s are in use, and its popularity is due in part to simplicity of operation, high receiver sensitivity and superb audio on TX and RX. The new IC-24G has these and other features. Full 80 channels (at 25kHz spacing) are available and readout is by channel number – selected by easy to operate press button thumbwheel switches. This readout can clearly be seen in the brightest of sunlight. Duplex and reverse duplex is provided along with a crystal controlled tone call Hi–10W and Lo–1W RF outputs is available along with a 12½ kHz upshift, should the new channel spacing be necessary. The old IC240 proved to be the most reliable rig we have ever sold – the IC24G because it is so similar, looks like following the same pattern. Remember for mobile use a rig MUST be easy to operate to be safe. Send for technical details.

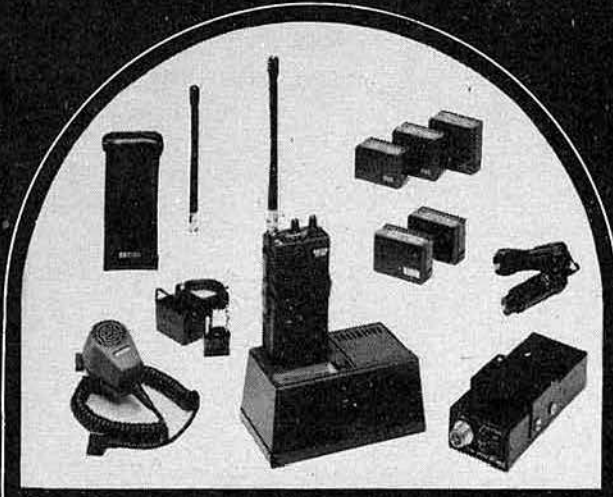
IC–251E **Great Base Stations** IC–451

ICOM produce a perfect trio in the VHF base station range, ranging from 6 Meters thru 2 Meters to 70 cms. Unfortunately you are not able to benefit from the 6m product in this country, but you CAN own the 215E for your 2 Meter station and the 451E for 70 cms.

Both are really well designed and engineered multi-mode transceivers capable of being operated from either the mains or a 12 volt supply. Both contain such exciting features as scan facilities, automatic selection of the correct repeater shift for the band concerned, full normal and reverse repeater operation, turning rate selection according to the mode in use, VOX on SSB, continuous power adjustment capability on FM and 3 memory channels. Of course they are both fitted with a crystal controlled tone burst and have twin VFO's as have most of ICOM's fully synthesized transceivers. There is now a superb low noise mast head pre-amp available for the IC-451.

ICOM

Buy Direct and Enjoy the Benefits



IC–2E (2m)
IC–4E (70 cm) **The Perfect Portable Pair.**

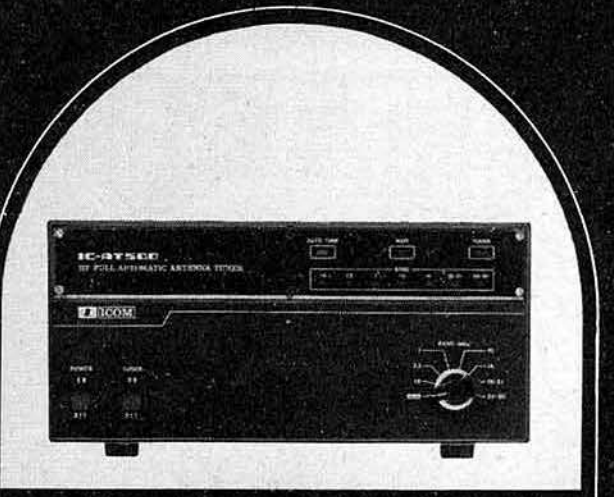
FULLY SYNTHESIZED – covering 144–145.996 in 400 5kHz steps (2E) 430–440 (4E)
POWER OUTPUT – 1.5W with the 9V rechargeable battery pack as supplied – but lower or higher output available with the optional 6V or 12V packs.
BNC ANTENNA OUTPUT SOCKET – 50 ohms for connecting to another antenna or use the Rubber Duck supplied.
SEND/BATTERY INDICATOR – Lights during transmit but when battery power falls below 6V it doesn't light indicating the need for a recharge.
FREQUENGY SELECTION – by thumbwheel switches indicating the frequency.
+ 5kHz SWITCH – adds 5kHz to the indicated frequency.
DUPLEX/SIMPLEX SWITCH – gives simplex or plus 600kHz or minus 600kHz Transmit (2E) + 116MHz (4E)
HI-LOW SWITCH – reduces power output from 1.5W to 150mW reducing battery drain.
EXTERNAL MICROPHONE JACK – If you do not wish to use the built-in electret condenser mic an optional microphone/speaker with PTT control can be used. Useful for pocket operation.
EXTERNAL SPEAKER JACK – for speaker or earphone.
This little beauty is supplied ready to go complete with nicad battery pack, charger, rubber duck.

A Full range of accessories in stock

IC ML1	
10 Watt Mobile Booster For IC2E	£49.00
BP5 11 Volt Battery Pack	£30.50
BP4 Empty Battery Case for 6x AA Cells	£ 5.80
BP3 Standard Battery Pack	£17.70
BP2 6 Volt Pack	£22.00
BC30 Base Charger for Above	£39.00
BC25 Mains Charger As Supplied	£ 4.25
DC1 12 Volt Adaptor Pack	£ 8.40
HM9 Speaker/Microphone	£12.00
CP1 Mobile Charging Lead	£ 3.20
LC1/2/3 Cases	£ 3.50 each

Agents (phone first – all evenings and weekends only)

Scotland – Jack GM8 GEC (031 665 2420)
Midlands – Tony G8AVH (021 329 - 2305)
Wales – Tony GW3 FKO (0874 2772 or 0874 3992)
North West – Gordon G3LEQ (0565 4040 ansafone service available)



Announcement of the New IC–AT500 Automatic Antenna Tuner

Icom's Research and Design Team is proud to announce the debut of the new IC-AT500 Automatic Antenna Tuner. This innovative piece of equipment is a marvel of electronic circuit wizardry and is the first of its kind on the market anywhere in the world today.

This compact 6.4 kg antenna tuner provides the following features:

Quick tune up

The newly developed detector circuit detects resistance and reactance of the load, and controls powerful motors to tune the two variable capacitors, thus making the tune up time very short.

Auto band switching

When the IC-720A, IC-701 (or IC-730 with the optional LDA Unit installed) is used, band switching of the tuner can be controlled by the band switch of the IC-720 720A or 730. This tuner has dual accessory sockets, so the auto band switching function can be used with the IC-2KL linear amplifier at the same time.

Pre-set capability

The matching circuit can be used for each band, so you are able to make quick QSY's and have trouble-free operation.

Four antenna connectors

This tuner has four coaxial sockets for antennas, and selects the suitable antenna for each band automatically. When the power of this tuner is turned off, this tuner can be used as an automatic antenna selector.

Two way power source

This tuner can be used with DC 13.8 volts or AC240 volts.

Thanet Electronics

ICOM

143 RECULVER RD.,
BELTINGE,
HERNE BAY, KENT.
Tel: 02273 63859

£699 NEW! WITH BUILT-IN VDU!!

Following the success of the Tono 7000E communications computer, we are now able to announce the arrival of a completely new machine on the market. The CWR 685 Telereader.
BRIEF FEATURES ARE:- Transmits and receives (via a suitable transceiver) CW, RTTY and ASCII (optional) – Built In 5" green display monitor. It will handle the alphabet, numerals, symbols and special codes on CW.
SPEEDS:- CW – 3 wpm to 50 wpm with automatic speed tracking RTTY and ASCII – 45.45,50,56.88.74.2 110 and 300 bauds. (300 bauds speed is possible when external modem or TTL input is used).
INPUT:- AF input for CW, RTTY and ASCII from phone jack (usable from 8 to 1000 ohms, 30 mV to 2 V.
DISPLAY OUTPUTS:- RF output and composite video output 1V P-P 75 ohms.
6 memories – 32 chrs each.
Printer interface – Centronic compatable parallel interface buit-in.
OUTPUT FOR OSCILLOSCOPE:- RTTY and ASCII impedance 200K ohm IV P-P.
NUMBER OF CHARACTERS DISPLAY:- 512 characters x 2 pages – total 1024.
POWER SOURCE – 13.8 V.D.C.
Complete with full size keyboard.
RECEIVE ONLY VERSION CWR 680 – £189 inc.

PRICES OF OTHER TONO QUALITY PRODUCTS

These prices may be subject to change, depending upon the state of the £

All inclusive of V.A.T.

Green Display Monitor CRT 120G	£125.00
Dot Matrix Printer HC 900	£449.00
Printer Socket SK7	£ 8.50
Linear Amplifiers:-	
UC 70 (430 mHz 55W)	£149.00
2M–50W (2m)	£ 65.00
2M–100W (2m)	£115.00
MR–150W (2m)	£159.00
MR–250W (2m)	£259.00
MR–28LB (26-30 MHz)	£ 65.00
Mast-Head Pre-amps:-	
RX 144 (including control)	£ 65.00
RX 430 (and psu box)	£ 70.00

Remember we also stock Yaesu, Jaybeam, Daytong, Welz, G-Whip, Western, TAL, Bearcat, RSGB publications.

Thanet Electronics

ICOM

Tono Theta 7000E £599

A great computer
on offer from Thanet

The new THETA Means that every Amateur can enjoy the visual display of CW, RTTY and ASCII in both transmit and receive modes. Just connect the TONO to any TV set via the antenna terminals or to a page printer from the parallel port provided. Bring up your CW speed in receiving or sending by either watching received signals or from recorded cassettes. Connection to the transceiver is via the key, phone and mic sockets.

Some of the Outstanding Features:

COMMUNICATIONS COMPUTER THETA 7000E
UHF and Composite Video Output Printer Interface. Wide range of transmitting and receiving speeds 10CW speeds + 8RTTY.
Built-in demodulator for high performance for 170Hz and 820 Hz shift.
Crystal controlled modulator for ASFK Hi or Lo tone.
Convenient ASCII key arrangement. Large capacity display memory. – 2 pages 32 chr x 16 lines split screen to RX and TX if required.
Automatic transmit/receive switch. Anti-noise circuit. Battery backed up memory 7 channels of 64 chrs. Send function. Buffer memory, 53 character type ahead, rub out function. Simultaneous access of the memory – 53 character type ah. LF (line feed cancel function. Cursor control CR/LF 172, 60 or 80 chrs per line) Echo function.
Word wrap around function, Transmit/receive in ASCII or RTTY, CW identification function. Mark and break (space and break) system. Monitor circuit & CW practice functions. Variable CW weights. Cross pattern checking output terminal, log computer output provided. Test message function (Ry and OBF) Receive only version £259

Phone or write for the price list of accessories for this unit

You will get a good deal from Thanet–CALL US!

What are the benefits of buying direct?

1) Full 2 years warranty on all equipment.
2) Excellent back up and after sales service using fully equipped workshop.
3) ICOM trained technical staff.
4) No charge for speedy delivery service.
5) Avoid disappointments – buy direct from the experts with years of experience.

Instant Credit Available in most cases.
How to place your order for all advertised products:

- Fill in the attached coupon.
- Phone us during office hours.
- Out of hours leave a message on our ansafone stating clearly your name, address, daytime Tel. No. Access/Barclaycard No.
- Write, enclosing full details of your requirements together with payment, quoting call sign if possible.

Please note Access/Barclaycard customers – goods must be sent to address registered with the credit card company.

Name .....
Call Sign .....
Address .....
.....
.....
Daytime Phone No. .....
Please rush me: .....
.....
I enclose cheque/P.O. for .....
..... or debit my Access/Barclaycard
number which is: .....
Signed: .....

Post to: Thanet Electronics Ltd.,
143 Reculver Road,
Herne Bay, Kent.

DATONG PRODUCTS
DESIGNED BY ENTHUSIASTS FOR ENTHUSIASTS!

KEYBOARD MORSE SENDER – THE ULTIMATE KEYBOARD – CHECK THESE FEATURES

- CONVENIENCE: no need for a power cable: four internal pen cells last for 300 hours and give continuous memory back up.
- EXCLUSIVE COLOUR CODED KEYBOARD DESIGN: Separate key switches beneath a tough polycarbonate membrane combine excellent feel with a splash proof wipe-clean surface.
- LAVISH MEMORY: four 64-character memories with auto-repeat and programmable "pause" function for all the routine sending.
- BUFFER MEMORY: ensures perfect sending despite less than perfect typing.
- COMPREHENSIVE CHARACTER SET: includes punctuation, procedure signals, accented letters. Plus a "merge" key for making any non-standard character.
- BEAUTY AND STYLE: only one inch thin and with four-colour panel Model MK looks every bit the thoroughbred it is. Model MK is supplied with output leads and spare connectors but without batteries (four HP7 pen cells).

NOW EVEN BETTER VALUE FOR MONEY

Model MK

MODEL ASP – THE "INTELLIGENT" RF CLIPPER

Model ASP modifies your speech signal direct from the microphone and makes it more effective at modulating your transmitter. The effect is as if the transmitter peak power were to increase by between two and three times. "Intelligent" means that unlike other speech processors, Model ASP automatically senses your voice level and reacts accordingly to always maintain the degree of true r.f. clipping selected (in decibels) by the panel push-buttons. Special circuitry does this without the undesirable side effects of simple a.g.c. devices. Adding a Datong r.f. clipper to a normal SSB transmitter has a similar effect to adding a linear amplifier but without the high cost and risk of TVI.

G8's – ARE YOU MISSING OUT?

Unless you can monitor the other bands you are missing a lot. If you have a 2 metre all-mode receiving set up, just add Model PC1 in series with its antenna and you have a superb general coverage receiver. What better way to listen in to all the non-VHF amateur bands, not to mention everything else from 60 kHz to 30 MHz? For sheer value for money there is no better way to get high performance general coverage reception. After all what a waste it is if your expensive 2 metre all-mode rig covers one band only?

Reviewed Shortwave Mag. Nov.

Model PC1

ATTENTION VHF SCANNER OWNERS!

Did you know that Model PC1 will extend the coverage of your SX 200 type scanner to include all the long, medium and short wave bands as well? This is an excellent way to listen to your favourite short wave broadcast stations without the extra expense of a complete new receiver.

MINIATURE RECEIVING ANTENNAS

If you don't have enough space to put up traditional receiving antennas, our active antennas are the answer. They need no tuning yet have constant sensitivity from 200 kHz to well over 30 MHz. Results are quite comparable to full size conventional antennas but the space saving is enormous. The indoor version (AD270) is 3 metres long and the outdoor version (AD370) is 2 metres long.

A TV-type feeder cable of any reasonable length can be used yet because the antennas are balanced dipoles any interference picked up by the feeder is rejected. Because of their wide frequency coverage Datong Active Antennas are ideal accessories for modern general coverage communications receivers.

Model AD270

Model AD370

Model DC144/28

YET ANOTHER 2 METRE CONVERTER?

Yes but not just another. Model DC144/28 is designed to overcome the overload and spurious signal problems experienced by conventional converters. It uses a Schottky diode balanced mixer with about 7dbm of local oscillator drive. This, coupled with a 3SK88 r.f. amplifier, gives an excellent combination of low noise figure and strong signal handling capability. Its input and output gain controls also help you get the best out of your main receiver without flattening it with excessive gain.

Model DC144/28 is available either as a complete cased unit (die cast box, S0239 connectors) or as a ready built and tested PCB module.

MODEL D70: THE GO-ANYWHERE MORSE CODE TRAINER

For building up your morse code reception speed there is no better method than the Datong "Morse Tutor".

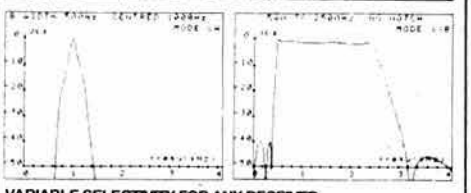
You learn the code with the characters at normal speed but with an extra delay between each one. As you improve you reduce the "DELAY" control until, with it fully reduced, you find you are reading code at the chosen speed and with correct spacing.

An important feature is that the unit is completely portable. This allows you to practise wherever and whenever you find it most convenient. The all-CMOS design gives about 60 hours of practice from a low cost PP3.

Model D70

PRICES: All prices include delivery in U.K. basic prices in £ are shown with VAT inclusive prices in brackets.

FL1	59.00 (67.85)	MPU	6.00 (6.90)
FL2	78.00 (89.70)	DC144/28	31.00 (35.65)
PC1	105.00 (120.75)	DC144/28 Module	25.00 (28.75)
ASP	69.00 (79.35)	Keyboard Morse Sender	112.20 (129.00)
VLF	22.00 (25.30)	RFA	25.50 (29.32)
D70	43.00 (49.45)	Codecall (Linked)	24.00 (27.60)
D75	49.00 (56.35)	Codecall (Switched)	25.50 (29.32)
RFC/M	23.00 (26.45)		
AD270	33.00 (37.95)		
AD370	45.00 (51.75)		
AD270+MPU	37.00 (42.55)		
AD370+MPU	49.00 (56.35)		



VARIABLE SELECTIVITY FOR ANY RECEIVER

Have a look at these curves (and the others in our data sheet) and you will see why a U.S. reviewer commented that the FL2 is "incredible – it's like having a tunable crystal filter."*

With Model FL2 connected in series with your speaker you can wipe out off-tune "monkey chatter", unwanted tones and sundry "burbles" from SSB, while for CW the ultra-steep skirts allow you to use wider bandwidths for a given rejection of off-tune signals. This makes tuning easier and reduces listening fatigue.

Model FL2 costs little more than a single special accessory filter yet it offers better performance, extreme versatility, and can be used with any receiver.

*R. S. Dicks, 73 Magazine, July 1981 p 119.

Reviewed CQ-DL Feb. 1981

Model FL2

Products not shown in this advertisement

Model Datest 1 Transistor Tester
Model Datest 2 Transistor Tester
RF Speech Processor Model D75
Model RFC/MRF Speech Processor PCB Module
Model MPU Mains Power Unit
Accessory Leads
Model VLF
Model FL1

NEW PRODUCTS PREVIEW

Available Shortly

MODEL DF1

Direction finder attachment for FM, VHF receivers/transceivers, gives directional readout on circle of LED's. Connects to loudspeaker and antenna jacks.

BROADBAND PREAMPLIFIER – MODEL RFA

- Wide bandwidth, 5 to 200 MHz, lets Model RFA replace a whole collection of single band amplifiers.
- Low noise figure, high intercept point (+ 25dbm), and moderate gain (9dbs) make Model RFA ideal for improving the sensitivity of HF and VHF transceivers, scanner receivers, PMR, marine VHF, without difficulties with overload.
- RF switched for convenient use with transceivers.
- Solid construction (same die cast case as Models VLF and DC144/28) with S0239 connectors.

Price: £25.50 plus VAT (£29.32 total)
Expected Availability: early January.

"CODECALL" SELECTIVE CALLING DEVICE

The new Datong Codecall adds "selective call" to any radio voice channel. A single self-contained unit at each end of the link sends or receives a coded audio signal. When the correct code is received, the receiver bleeps loudly.

The only connection needed to a transceiver is to the external loudspeaker jack. Sending is via direct audio into the microphone.

"Codecall" allows totally silent stand-by operation yet with confidence that when that specific call comes, you won't miss it.

Over 4000 different codes can be selected by internal link or by three 16-way panel switches, depending on the model. This practically eliminates false alarms.

NOTE: All transmissions must be identified as required by the licence conditions.

Price per unit: Link programmable £25.50 + VAT (£29.32)
Switch programmable £24.00 + VAT (£27.60)

DATONG ELECTRONICS LIMITED

ALL DATONG PRODUCTS ARE DESIGNED AND BUILT IN THE U.K.

Data sheets on any products available free on request – write to Dept R.C.

DATONG ELECTRONICS LIMITED

Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Tel: (0532) 552461

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

OUR NAME MEANS A GOOD DEAL

A REMARKABLE RIG AT AN AMAZING PRICE!

£219

PCS 3000
2M FM 25 WATTS
S.A.E. for colour leaflet

The PCS 3000 by Azden is an advanced design combining state of the art with reliability. For the amateur who demands the utmost in versatility at a realistic price, the PCS surely combines all these qualities into one neat package. Full coverage from 144 to 146MHz is possible plus extended coverage into the American band up to 148MHz with modification. A compact microcomputer control unit is at the heart of the PCS 3000 providing control data for its many functions. In order that the memory information is not lost when the unit is disconnected from the 12V dc supply, a built-in ni-cad battery charged from the dc supply line is incorporated. Frequency selection is by remote microphone control or "touch pad" front panel controls in steps of 25kHz or 12½kHz. The "on-board" microcomputer has 8 memories including offset and priority information.

Three scan modes are possible: memory, band and programmable "limited band" with pause and auto-resume. 1,750Hz tone oscillator and 600kHz shift is incorporated with repeater input listening possible at the flick of the microphone side switch and, of course, it has a conservative 25 watts output rating that will put your signal head and shoulders above the 10 watt brigade. We could go on about its high/low power features, its advanced construction and its technical parameters, but maybe we should suggest you send us an S.A.E. for the full colour brochure on the advanced PCS 3000.

SEE PAGE 13 FOR EASY MAIL ORDER SLIP

NEW

AZDEN PCS 300

BREAKS THE PRICE BARRIER

£184

(incl. AC charger)

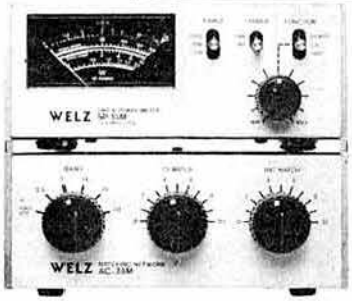
3 WATTS
144-146MHz
12½kHz STEPS
"PIEZO BLEEP"

We've really broken the price barrier with this brand new unit from Azden combining all the features you've ever wanted in a hand-held at an incredible inclusive price. Incredibly powerful, it will give over 3 watts output in the high power mode with ½ watt in the low power position. Coverage is 144 to 146MHz in 12½kHz steps, ideal for UK use. Tone burst and 600kHz repeater shifts are all included for any repeater in Europe. The clear LCD display is a mine of information, indicating frequency, memory address, repeater shift, bar "S meter" reading, RF output and low battery volts. The front panel key pad is of superior construction with a piezo bleeper indicating key entry on every function.

Comprehensive scanning facilities include band scanning and memory scanning plus programmable upper and lower band limits, with pause and auto resume. Unlike most rigs the memory back-up is permanently connected as it draws a miserly 0·01ma! Other controls include programmable repeater shift, dial illumination, key lock, PTT lock etc. Deliveries of this amazing rig are due in February and at this price it's a real breakthrough.

WELZ RF PRODUCTS

BUDGET LINE



SP15M POWER METER **£29.95**

Here's real economy in line power meter ideal for the HF/VHF operator. Maximum handling is 200 watts and forward/reflected power is directly read in 3 ranges: 0-2·5, 0-20W and 0-200W. Sensitivity is constant throughout the range 1·8-150MHz.

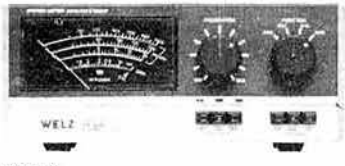
AC 38M 3·5-29MHz ATU **£59.00**

This is a must for solid state rig owners. Designed for coax feed, this ATU covers 8 bands 3·5 to 30MHz with a straight through position. Rated at 400 watts it will match anything between 10 and 500 ohms.

NEW MODEL SP45

Here's a brand new SWR and Power meter for the VHF/UHF enthusiast. It has a completely flat response from 140-470MHz for really accurate measurements. Power ranges of 0-3W, 20W and 100W caters for most popular makes of equipment.

PROFESSIONAL LINE



MODELS
SP200 1·8 160MHz 20W-200W-1kW **£59.95** (n.c.)
SP300 1·8 500MHz 20W-200W-1kW **£79.95** (n.c.)
*SP400 130 500MHz 5W-20W-150W **£59.95** (n.c.)
*Note: VHF model has 'N' sockets

Welz VSWR/POWER meters are high quality instruments approaching laboratory accuracy. They are capable of providing extremely accurate measurements of both power and voltage standing wave ratio. Features include high sensitivity (2·5W full scale 1·8-500MHz), and completely flat response.

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

LARGEST STOCKS IN THE SOUTH!

All prices include VAT

PRICE LIST – JANUARY 1982

Carriage charge in brackets

All prices subject to change without notice

TRIO

TS830S	160-10m transceiver 9 bands	£694.00 (5.00)
VFO230	Digital VFO with memories	215.00 (5.00)
AT230	All-band ATU power meter	119.00 (2.25)
SP230	External speaker unit	34.95 (1.50)
DS2	Optional dc pack for TS830S	43.95 (1.50)
DFC230	Dig fequency remote controller	179.00 (1.50)
YK88C	500Hz CW filter	29.60 (1.00)
YK88CN	270Hz CW filter	32.60 (1.00)
TS530SE	160-10m trans 200w pep digital	534.00 (5.00)
VFO240	External VFO	92.50 (5.00)
SM220	Station monitor scope	198.00 (5.00)
BS8	Pan display TS820/180/830	44.85 (.50)
BS5	As above for TS520	44.85 (.50)
R820	Amateur band receiver	589 (5.00)
YG455C	500Hz CW filter	61.00 (.50)
YG455CN	250Hz CW filter	65.00 (.50)
YG88A	6kHz AM filter	35.40 (.50)
TS180S	160-10m S/State transceiver	679.65 (5.00)
VFO180	External VFO	96.60 (1.50)
SP180	External speaker unit	36.80 (1.50)
AT180	Matching 200W antenna tuner	95.45 (5.00)
YK88C	500Hz CW filter	29.60 (.50)
YK88S	Second SSB filter option	29.20 (.50)
PS30	AC power supply for TS180S	88.50 (5.00)
TS130S	8 band 200W pep	525.00 (5.00)
TS130V	8 band 20W pep	445.00 (5.00)
DFC230	Dig frequency remote controller	179.00 (1.50)
TL120	200W pep linear for TS120v	144.00 (5.00)
MB100	Mobile mount for TS120/130	17.00 (1.00)
YK88C	500Hz CW filter	29.60 (.50)
YK88S	2nd SSB filter option	32.60 (.50)
VFO120	External VFO	85.00 (5.00)
SP120	Base station external speaker	23.00 (1.25)
SP40	New mobile speaker unit	12.40 (1.50)
AT130	100W antenna tuner	79.00 (1.50)
PS20	AC power supply TS120/130V	49.45 (5.00)
PS30	AC power supply TS120/130S	88.50 (5.00)
MA5	5 band mobile aerial system	88.75 (4.50)
TL922	160-10 metre 2KW linear	624.00 (5.00)
MC50	dual impedance desk microphone	25.75 (1.50)
MC35S	Fist microphone 50K impedance	13.80 (1.00)
MC30S	Fist microphone 500ohm imp.	13.80 (1.00)
LF30A	HF lowpass filter. 1kW	19.30 (1.00)
RD300	1kW oil filled dummy load	52.00 (1.50)
TS770E	2m/70cm all mode transceiver	785.00 (5.00)
SP70	External speaker unit	18.60 (1.00)
TR9000	2m synthesised multimode	374.00 (5.00)
TR9500	70cm all-mode	449.00 (5.00)
BO9	Base plinth for TR9000	34.95 (5.00)
TR7800	2m FM synthesised mobile	284.00 (5.00)
TR7850	40w version of above	314.00 (2.50)
TR8400	70cm FM synthesized	334.00 (2.50)
PS10	AC psu for above	64.75 (2.50)
TR2300	2M FM synthesised portable	166.75 (5.00)
VB2300	10W amplifier for TR2300	58.00 (1.50)
MB2	Mobile mount TR2300/VB2300	17.70 (1.00)
RA1	Rubber flexible antenna	6.90 (.50)
PS1200	AC power unit and charger	29.50 (1.50)
TR2400	2m FM synthesised handheld	198.95 (5.00)
SMC24	External speaker/mic	13.80 (1.00)
ST1	Base stand and quick charger	45.00 (1.50)
BC5	12V quick charger	18.40 (1.50)
SC3	Soft carrying case.	11.50 (.50)
LH1	Hard leather holster	20.00 (.50)
PB24	Spare battery pack/charger lead	15.00 (1.50)
PL1	Spare power/charge lead	1.50 (.15)
R1000	Gen. Coverage Receiver	295 (5.00)
SP100	External speaker	26.90 (2.50)
HC10	Digital desk World Clock	58.75 (1.50)
HS5	Deluxe Comm. headphones	21.85 (1.00)
HS4	Standard headphones	10.35 (1.00)
DM801	Dip meter	60.00 (1.75)
TR7730	New 25W FM transceiver	247.00 (5.00)

YAESU

FT101ZFM	160-10m 9 band transceiver	590.00 (5.00)
FT101ZDFM	160-10m 9 band transceiver	645 (5.00)
DIGT 101Z	Digital unit for	90.00 (1.00)
DCT101Z	DC adaptor	42.50 (1.00)
FV101Z	Remote vfo	112.00 (5.00)
FANT101	Fan for 101 series	13.80 (1.00)
FT902DM	9 band AM/FM transceiver	885.00 (5.00)
FT902DE	9 band transceiver	790.00 (5.00)
FC902	9 band atu. swr/pwr etc	135.00 (5.00)
FTV901R	Transverter fitted 2m module	285.00 (5.00)
430TV	70cm module for above	185.00 (5.00)
144TV	2m module for transverter	100.00 (1.75)
70TV	4m module for transverter	80.00 (1.75)
YO901P	Monitor scope with pan. adap.	330.00 (5.00)
YO901	Standard monitor scope	256.00 (5.00)
FV901DM	Remote vfo for 901	260.00 (5.00)
SP901	External speaker	31.00 (2.00)
FL2100Z	9 band 1200W linear	425.00 (5.00)
FT107	9 band solid state 100W	725.00 (5.00)
FT107DMS	As above but with memory	799.00 (5.00)
DMST107	Memory unit	92.75 (2.00)
FV107G	Remote vfo for above	98.50 (5.00)
SP107G	External speaker	29.90 (2.00)
FC107G	Aerial tuning unit	112.70 (5.00)
FP107	230V AC power module	101.95 (2.50)
FP107EG	As above in cabinet	113.00 (5.00)
FT707	8 band solid state 100W	549.00 (5.00)
FP707	230V AC power supply	125.00 (5.00)
FC707	Aerial tuner (unbalanced only)	85.00 (2.00)
MR7	Metal rack for above	15.70 (2.00)
MMB2	Mobile mounting bracket	16.00 (1.00)
FRG7	0·5-30MHz receiver	199.00 (n.c.)
FRG7700	SSB/AM/FM recvr. dig. readout	329.00 (n.c.)
MEM7700	Memory unit for above	90.00 (1.00)
Converters for above:		
FRV770A	118-150MHz in stock	69.75 (1.75)
FRV7700B	50-60MHz & 118-150MHz	75.50 (1.75)
FRV7700C	140-170MHz	65.95
FRV7700D	70-80MHz & 118-150MHz	72.45 (1.75)
FRT7700	Receiver aerial tuner	37.85 (2.00)
FF5	LF filter for above	9.95 (1.00)
FT480R	2m all-mode transceiver	365.00 (2.00)
FP80A	230V AC power supply	63.25 (2.00)
FL2050	50 watt linear	126.50 (2.00)
FT780R	70cm all-mode transceiver	449 (2.00)
FT290R	2m all-mode portable	249.00 (2.00)
NC11C	AC charger	8.00 (1.00)
CSC-1	Carrying case	3.45 (.50)
MMB-11	Mobile mounting bracket	22.25 (1.50)
FL2010	10 watt linear for FT290	64.00 (2.00)
NC/WSE	2 amp hour ni-cad pack	20.00 (1.75)
FT208	2m synthesized portable FM	209.00 (n.c.)
NC9C	AC charger	8.00 (1.00)
FT708R	70cm hand-held	219.00 (n.c.)
FP4	230V/4 amp psu	42.95 (2.00)
FP12	230V/12 amp psu	86.25 (2.50)
YP150Z	150W dummy load power meter	92.00 (2.00)
YH55	Standard 8 ohm headphones	9.95 (1.00)
YH77	Lightweight headphones	10.00 (1.00)
QTR24D	World Ham clock	28.00 (1.50)
YM34	600/50k ohm base mic 8 pin plug	21.45 (1.00)
YM35	600 ohm hand mic. up/dwn 8pin.p.	13.80 (1.00)
YM36	600 ohm as above (no up/dwn)	13.00 (1.00)
YM37	600 ohm hand mic. 8 pin plug	6.90 (1.00)
YE7A	600 ohm hand mic. 4 pin plug	6.90 (1.00)
YD844A	600/50k ohm base mic. 4 pin plug	25.30 (1.00)

FDK VHF/UHF EQUIPMENT

M700EX	2m FM 25 watt trcvr. 12v DC	199.00 (n.c.)
M750E	2m FM/10W trcvr 12v DC	289.00 (n.c.)
Expander	70cm transverter	219.00 (n.c.)
PS750	230v A.C. power supply	66.00 (2.50)
Palm II	2m FM 6 channel portable	109.00 (n.c.)
Palm IV	70cm FM 6 channel portable	149.00 (n.c.)
TB1	1750Hz tone burst	10.00 (n.c.)
T1200	2m FM synthesised portable	179.00 (n.c.)
TM56B	2m FM monitor 230v/12v DC	89.90 (n.c.)
CC2	Leather case for Palm II/IV	5.75 (.50)
BC2	230v AC battery charger	4.50 (.50)
BB2	"AA" size external battery case	5.00 (.50)
BT2	Ni-cad battery pack	12.00 (.50)
Xtals for Palm II and Palm IV		3.00 (.15)
Xtals for TM56B		2.50 (.15)

MICROWAVE MODULES

STOP PRESS
New Microwave Morse Tutor that speaks to you! **115.00**

MMT28/144	10m linear transverter	99.00 (1.75)
MMT144/28	2m linear transverter	99.00 (1.75)
MMT432/28-S	70cm linear transverter	149.00 (1.75)
MMT432/144-R	70cm linear transverter	184.00 (1.75)
MMT70/28	4m linear transverter	115.00 (1.75)
MMT70/144	4m linear transverter	184.00 (1.75)
MMT1296/144	23cm linear transverter	184.00 (2.25)
MML144/25	2m 25W linear amplifier	59.00 (1.75)
MML144/40	2m 40W linear amplifier	77.00 (1.75)
MML 144/100	2m 100W linear amplifier	129.00 (2.75)
MML432/20	70cm 20W linear amplifier	77.00 (1.75)
MML432/50	70cm 50W linear amplifier	119.00 (2.75)
MML432/100	70cm 100W linear amp	228.65 (2.75)
MM2000	RTTY to TV converter	169.00 (1.75)
MM4000	RTTY Tcvr with keyboard	289.00
MMC28/144	10m converter	27.90 (.65)
MMC50/28	6m converter	27.90 (.65)
MMC70/28	4m converter	27.90 (.65)
MMC70/28LO	4m converter	29.90 (.65)
MMC144/28	2m converter	27.90 (.65)
MMC144/28LO	2m converter	29.90 (.65)
MMC432/28-S	70cm converter	34.90 (.65)
MMC432/144-S	70cm converter	34.90 (.65)
MMC435/51	70cm ATV converter	34.90 (.65)
MMC435/600	70cm ATV converter	27.90 (.65)
MMC1296/28	23cm converter, 10m output	32.20 (.65)
MMK1296/144	23cm converter, 2m output	59.80 (1.75)
MMDPT	Frequency counter probe	11.50 (.65)
MMA28	10m preamplifier	14.95 (.65)
MMA144V	2m RF switched preamp	34.90 (.65)
MMA1296	23cm preamplifier	29.90 (.65)
MMF144	2m filter	9.90 (.65)
MMF432	70cm filter	9.90 (.65)
MMV1296	70cm 23cm varactor tripler	34.50 (.65)
MMR15/10	15db attenuator, BNC terms	9.90 (.65)

JAYBEAM ANTENNAS

TB3	HF 3 element Tribander Beam	181.00 (4.50)
VR3	HF Vertical Triband	46.00 (3.00)
4 metre Antennas		
4Y/4M	4 element yagi	22.42 (3.00)
PMH2/4M	2 way phasing harness	13.22 (1.00)
2 metre Antennas		
DC1/WB	Wide band discone (100-470MHz)	41.40 (2.50)
LR1/2M	Omnidirectional vertical	25.87 (2.50)
C5/2M	5dB glass fibre colinear	47.70 (3.50)
5Y/2M	5 element yagi	12.07 (2.00)
8Y/2M	8 element yagi	15.50 (2.50)
10Y/2M	10 element 'long yagi'	33.35 (3.50)
PBM10/2M	10 element Parabeam	39.67 (3.50)
PBM14/2M	14 element Parabeam	48.30 (4.50)
5XY/2M	Crossed 5 element yagi	24.72 (3.00)
8XY/2M	Crossed 8 element yagi	31.00 (3.50)
10XY/2M	Crossed 10 element yagi	40.80 (4.00)
X6/2M/X12/70cm	Dual band crossed yagi	41.40 (4.50)
PMH/2C	2 way phasing harness	8.00 (.75)
Q4/2M	4 element quad yagi	25.87 (2.50)
Q6/2M	6 element quad yagi	33.90 (4.50)
D5/2M	Double 5 slot-fed yagi	21.85 (2.50)
D8/2M	Double 8 slot-fed yagi	29.32 (4.00)
SVMK/2M	Kit for vertical polarisation	8.00 (1.50)
UGP/2M	ground plane	10.90 (1.50)
HO/2M	Mobile 'halo' head only	5.15 (1.50)
HM/2M	Mobile 'halo' with 24" mast	5.75 (1.75)
PMH2/2M	2 way phasing harness	10.90 (1.00)
PMH4/2M	4 way phasing harness	25.30 (1.75)
70cm Antennas		
C8/70cm	8dB glass fibre colinear	54.00 (3.50)
D8/70cm	Double 8 slot-fed yagi	22.40 (2.50)
PBM18/70cm	18 element Parabeam	27.60 (2.50)
MBM48/70cm	48 element Multibeam	31.00 (3.00)
MBM88/70cm	88 element Multibeam	42.55 (4.50)
8XY/70cm	Crossed 8 element yagi	36.80 (3.50)
12XY/70cm	Crossed 12 element yagi	46.00 (4.50)
PMH2/70cm	2 way phasing harness	9.20 (1.00)
PMH4/70cm	4 way phasing harness	19.55 (1.50)
23cm Antennas		
D15/1296	Double 15 slot-fed yagi	36.80 (1.50)
PMH2/23cm	2 way phasing harness	27.60 (1.00)

G-WHIP MOBILE ANTENNA RANGE

Tribander Helical for 10/15/20 metres	25.80 (2.00)
LF40m Coil for above	6.55 (1.00)
LF80m Coil for above	6.55 (1.00)
LF160m Coil for above	6.55 (1.00)
LF telescopic resonator whip	4.25 (1.00)
Base mount single hole fixing + 3m cable	5.75

AERIAL ROTATORS

CDE AR40 (5 core cable)	62.00 (1.50)
Channelmaster 9502 (3 core)	54.00 (2.00)
Sky King SU4000 (6 core)	75.00 (2.50)
KR 400RC (5 core) complete	99.00 (2.00)
CDE alignment bearing	7.75 (1.00)
Channelmaster alignment	11.75 (1.00)

HF ANTENNAS

Mini-Products HQ-1 20/15/10m 2 el	115.00 (2.50)
Mini-Products C4 20/15/10m vert dipole	55.00 (2.00)
Mosley TD3JR 20/15/10m wire dipole	34.50 (1.50)
Mosley "Mini-Beam" 20/15/10m 2 el. 600W	99.00 (2.00)
Mosley "Mini-Beam" 20/15/10m 2 el. 2kW	129.00 (2.00)
Mosley TA32 20/15/10m 2 el.	89.70 (2.00)
Mosley TA33 20/15/10m 3 element	133.40 (2.50)
Mosley Mustang 20/15/10m 3 element 2kW	166.75 (4.00)
Hy-Gain 12AVQ 20/15/10m vertical	43.00 (2.00)
Hy-Gain 14AVQ 40-10m vertical	58.00 (2.00)
Hy-Gain 18AVT/WB 80-10m vertical	89.95 (2.50)

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

THIS MONTHS "SPECIALS"

GLOBAL PS-15 '6 amp' power supply £31.95

Here's a new base station power supply ideal for the modern rig or smaller linears. An extremely large transformer ensures safe, quiet operation and the built-in metering monitors both voltage and current drawn. Be warned, there are cheaper supplies about and quite a few blown rigs to testify as to their value for money!

YW3 SWR/PWR/FS
£11.95

HF5 80-10m vertical 200 watts	48.00 (2.00)
Radial Kit for HF5	28.00 (2.00)
Sagant EL40X 80-40 Balun fed dipole (79')	36.50 (1.50)
Jaybeam TB3 HF 3 element Tribander	181.70 (4.50)
Jaybeam VR3 HF Vertical Trihand	46.00 (3.00)
Western DX5V 5-band	89.00 (3.00)

DATONG

FL1 Automatic audio filter. Int batt.	67.85 (n.c.)
FL2 Multi-mode audio filter	89.70 (n.c.)
PC1 Receiver adapt. 50kHz-30MHz 144MHz o/p	120.75 (n.c.)
ASP Auto RF speech processor	79.35 (n.c.)
VLF Recv. converter. 0-500kHz 28MHz o/p	25.30 (n.c.)
D70 Morse tutor. Self contained	49.00 (n.c.)
D75 RF speech processor (manual control)	56.00 (n.c.)
AD270 Active recv. aerial (indoor model)	37.95 (n.c.)
AD370 Outdoor version of above	51.75 (n.c.)
A/C pwrd. versions AD270 + p.s.u. £42.55 AD370 £56.35	
A/C power supply only	6.90 (n.c.)
DC144/28 2 metre recv. converter	35.65 (n.c.)

ADONIS MICROPHONES

AM202G Mobile safety mic	20.95 (n.c.)
AM202S Mobile safety mic	20.95 (n.c.)
AM202H Mobile safety mic	29.00 (n.c.)
AM502G Base station compressor mic	39.00 (n.c.)
AM601 Compressor mic.	44.00 (n.c.)
AM802G Base station compressor mic	59.00 (n.c.)

SEM

2m power amplifier/pre-amplifier 5/30W	57.00 (1.00)
2m power amplifier/pre-amplifier 16/50W	69.50 (1.50)
2m power amplifier/pre-amplifier 16/100W	126.50 (1.50)
2m converter	24.70 (.35)
2m Auto switching pre-amplifier	25.00 (.35)
70cm Auto switching pre-amplifier	30.70 (.35)
2m pre-amplifier	14.95 (.35)
70cm pre-amplifier	19.00 (.35)
2-40MHz pre-amplifier auto switching	18.85 (.35)
2-40MHz pre-amplifier	11.90 (.35)
PA3 miniature 2m pre-amplifier	8.00 (.35)
PA70 miniature 70cm pre-amplifier	11.95 (.35)
Z Match Aerial tun unit 1-8-30MHz 500W	65.00 (1.50)
EZITUNE Aerial tuning aid	30.48 (.75)
IAMBIC Keyer	34.50 (.75)

VHF/UHF MONITORS

TM56B FM Scanner 4 + 12 channels	89.00 (n.c.)
Sound Air 008 8 channel FM monitor	69.00 (n.c.)
Sound Air M161 16 channel FM monitor	59.00 (n.c.)
MF083 Marine or Amateur + 3 FM broad.	85.00 (n.c.)
BEARCAT 220FB VHF/UHF	258.00 (n.c.)
SX200 VHF/UHF. New stock just arrived!	260.00 (n.c.)
SR9 Tuneable 144-148 or 156-162MHz	46.00 (n.c.)
AR22 2m FM pocket synthesized handheld	89.00 (n.c.)
AR22 flexible antenna	3.00 (n.c.)

MOBILE AERIALS

ASP201 2m ¼ wave with base	3.50 (1.25)
ASP2009 2 5/8th wave with base	9.25 (2.00)
ASP3009 2m 5/8th wave with base	9.75 (2.00)
ASP462 70cm co-linear with base	8.25 (1.25)
Magnetic base adaptor	8.50 (.75)
ASP677 2m 5/8th wave	14.95 (2.00)
ASP667 70cm co-linear	17.95 (1.25)
ASPM125 28MHz ¼ wave	18.50 (2.00)
Magnetic base adaptor	8.50 (.75)
ASP 'no hole' boot mount adaptor	3.75 (.50)
2NE 2m 7/8th mobile whip	13.00 (2.00)
RG4M Base for above aerial	3.50 (.75)
GSS Heavy duty gutter/boot mount	3.15 (.50)
MB5 Magnetic mount with 5m coax	7.95 (1.00)
10SE 28MHz whip 1·72m long	11.50 (1.25)
15SE 21MHz whip 1·72m long	11.50 (1.25)
20SE 14MHz whip 1·72m long	13.80 (1.25)

WELZ PROFESSIONAL RF PRODUCTS

SP200 1·8-160MHz 20/200/1kW SWR/PWR	59.00 (n.c.)
SP300 1·8-500MHz 20/200/1kW SWR/PWR	79.00 (n.c.)
SP400 130-500MHz 5/20/150W SWR/PWR	59.00 (n.c.)
SP-15M 1·8-150MHz 2½/20/200W SWR/PWR	29.00 (n.c.)
AC-35M 3·5-30MHz 400W a.t.u. (unbalanced)	49.00 (n.c.)
AC-38M As above with new bands.	(n.c.)
CH-20A 2 way coax switch. 1kW SO239	15.95 (n.c.)
CH-20N 2 way coax switch. 1kW 'N'	23.95 (n.c.)
CT-03N Dummy load. 3W 1·3GHz 'N'	29.00 (n.c.)

DISCOUNT
TX FM MONITOR £9 + 75p p&p
RF POWERED WITH HEADPHONE

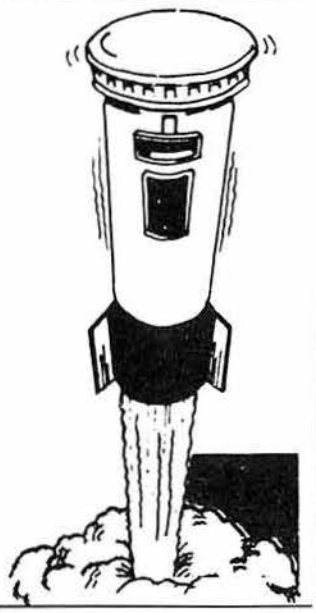
SHORT WAVE LISTENER AERIALS

3-30MHz Inverted "L"	9.95 (1.00)
3-30MHz Broad band dipole	29.00 (1.00)
Mosley RD5 all-band dipole	40.00 (1.00)
CT-20G ditto 20W 2·5GHz 'N' (gold)	t.b.a. (n.c.)
CT15A ditto 15/50W 450MHz	6.95 (n.c.)
CT15N ditto 15/50W 450MHz	11.75 (n.c.)
CT 150 ditto 150/400W 250MHz	31.00 (n.c.)
CT 300 ditto 300-1kW 250MHz	43.00 (n.c.)

MISC STATION ITEMS

SEIF 13-8V 4 amp AC power supply	24.95 (2.00)
PS125 6 amp AC power supply	29.00 (2.00)
EK121 Katsumi Electronic Keyer	29.00 (1.00)
EKM12 Matching side tone monitor	10.95 (1.00)
CW2A general purpose morse oscillator	6.95 (.65)
Telegraph CW key (manual)	10.50 (.75)
YW3 Twin SWR/Pwr/Field strength meter	11.95 (.50)
MF210 Self powered 2M FM monitor	12.95 (.50)
FX1 d/l station w/meter 700kHz-250MHz	28.00 (1.00)
DM81 700kHz-250MHz dip meter	51.75 (1.00)
Station log books	1.95 (.50)
12BY7A driver valves	2.75 (.50)
6146B/S2001A P.A. valves	8.70 (.50)
6JS6C P.A. Valves Matched pairs	9.95 (.50)
PL259 plugs	.63 (n.c.)
PL259 reducers	.17 (n.c.)
SO239 chassis sockets	.60 (.10)
PL259 joiners	.85 (.10)
N. Plugs. Silver plated UR67	2.00 (n.c.)
N. Plugs. Silver plated UR43	2.00
4 pin mic plugs	.85 (.10)
3 pin mic plugs	.85 (.10)
6 pin mic plugs (FDK 750)	1.00 (.10)
3 pin chassic socket	.85 (.10)
4 pin chassis socket	.85 (.10)
BNC plugs (bayonet)	.90 (.05)
Pen Cell Ni-cads (HP7 size)	1.20 (.05)
Cigar lighter plugs	.55 (.10)
UR67 cable 50Ω per metre	.69 (.10)
UR43 cable 50Ω per metre	.23 (.05)
5 core rotator cable per metre	.30 (.05)
BL40X baluh 50Ω	11.25 (.35)
3 core rotator cable. Per metre	.22 (.05)
Ferrite rings 1⅛" diameter	.35 (.05)
Mosley aerial insulators	.30 (.05)
KX2 SWL aerial tuner 0·5-30MHz	29.90 (1.50)
APM1 Audio Peak and notch filter	33.00 (1.00)
HP3A TVI high pass filter (UHF T.V.)	3.50 (.50)
Drake TV3300 LP Low Pass Filter	18.40 (1.20)
Shure 444D high impedance desk mic	27.50 (1.50)
Shure 201 high impedance hand mic	12.50 (1.00)
Trio HCM10 Digital World Clock	55.20 (1.50)

DATONG D70 MORSE TUTOR £49.00



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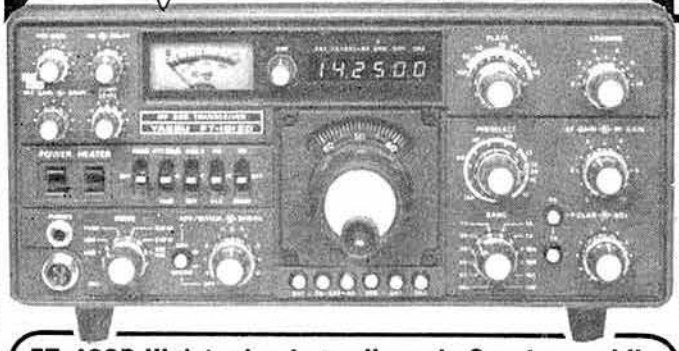

FT-101ZD Mk III

YAESU's FT-101ZD with FM is the most popular HF rig on the market thanks to its very comprehensive specification and competitive price. Incorporates notch filter, audio peak filter, variable IF bandwidth plus many other features.

FT-480R High technology all-mode 2metre mobile

The most advanced 2 metre mobile available today– USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system

FT-707 All solid-state HF mobile transceiver

The definitive HF mobile rig, digital, variable IF bandwidth, 100watts PEP SSB. AM, CW (pictured here with 12 channel memory VFO). Latest bands.

FRG-7 General coverage receiver

The set with the world–wide reputation. YAESU's famous FRG-7 out–performs many a more expensive set. Rugged and reliable, it features high sensitivity and Wadley loop stability – a delight to use for the established amateur and new SWL alike.

FRG-7700 High performance communications receiver

YAESU's top of the range receiver. All mode capability. USB, LSB, CW, AM *and* FM 12 memory channels with back up. Digital quartz clock feature with timer. Pictured here with matching FRT–7700 Antenna tuner and FRV–7700 VHF converter.

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FT-ONE SUPER HF TRANSCEIVER

This is the latest and most exotic product from YAESU's superb design team. The new FT-ONE provides continuous RX coverage of 150KHz – 30MHz plus all nine amateur bands (160 thru 10m).

All mode operation LSB, USB, CW, FSK, AM, FM • 10 VFO system • **FULL** break-in on CW • audio peak filter • notch filter • variable bandwidth and IF shift • keyboard scanning and entry • RX dynamic range over 95dB!

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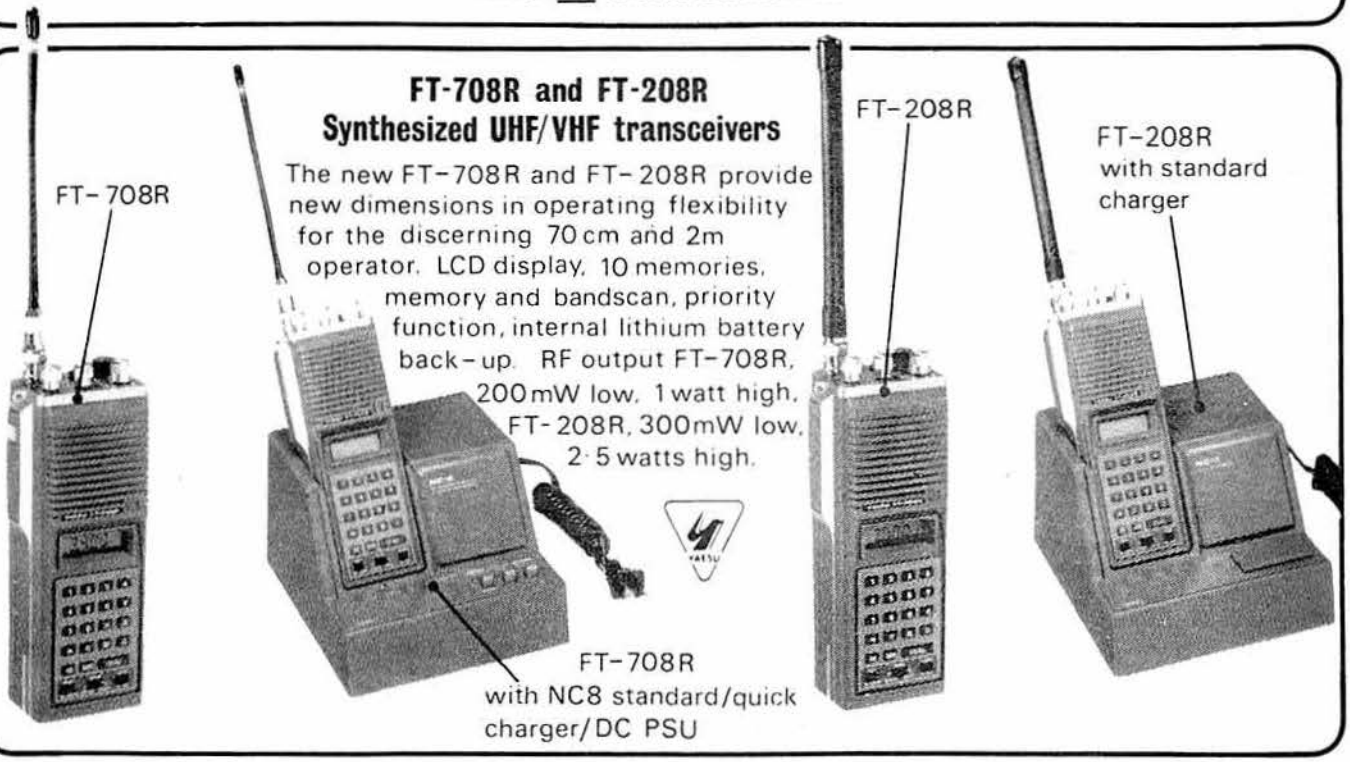
FT-708R and FT-208R
Synthesized UHF/VHF transceivers

The new FT-708R and FT-208R provide new dimensions in operating flexibility for the discerning 70cm and 2m operator. LCD display, 10 memories, memory and bandscan, priority function, internal lithium battery back-up. RF output FT-708R, 200mW low, 1 watt high, FT-208R, 300mW low, 2·5 watts high.



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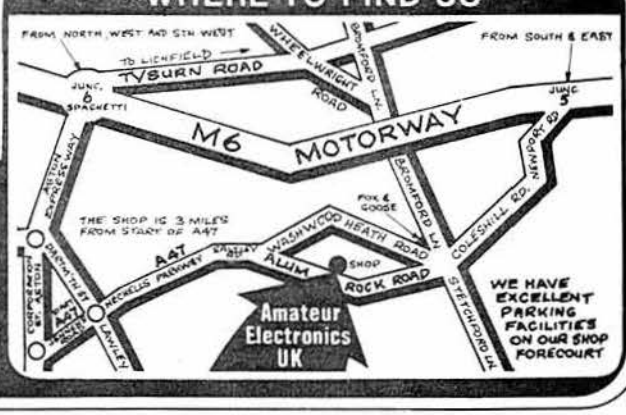

Amateur Electronics UK
508-516 Alum Rock Road · Birmingham 8
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THE LATEST 2m FM 25W RIG

- COMPACT SIZE
- 25 WATTS
- 5 MEMORIES
- MEMORY SCAN
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TRIO

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YK 88CN	270Hz CW filter	32.66	(0.50)
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TS 130V	8 band 20W PEP transceiver	445.00	—
VFO 120	External VFO	85.00	(1.50)
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SP 120	Base station external speaker	23.00	(1.50)
AT 130	100W antenna tuner	79.00	(1.50)
PS 20	AC power supply – TS 130V	49.00	(2.50)
PS 30	AC power supply – TS 130S	88.00	(5.00)
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MC 35S	Fist microphone 50K ohm imp	13.80	(0.75)
MC 30S	Fist microphone 500 ohm imp	13.80	(0.75)
LF 30A	HF low pass filter 1kW	17.90	(0.75)
TR 9000	2m synthesised multimode	371.00	—
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TR 7800	2m synthesised FM mobile 25W	284.00	—
TR 7730	2m synthesised FM compact mobile 25W	247.00	—
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BC 5	12V quick charger	18.40	(1.00)
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PB 24	Spare battery pack and charger lead	15.18	(0.75)
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TR 9500	70cm synthesised multimode	449.00	—
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ICOM

IC 730	HF mobile transceiver 8 band	586.00	—
IC 720A	HF transceiver and gen cov receiver	883.00	—
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IC 2E	2m Fm synthesised handheld	169.00	—
IC L1/2/3	Soft cases	3.50	(0.50)
IC HM9	Speaker/microphone	12.00	(0.75)
IC BC30	230V ac base charger and hod	39.00	(1.50)
IC BC25	230V ac trickle charger	4.25	(0.75)
IC CP1	Car charging lead	3.20	(0.50)
IC BP2	6V Nicad pack for IC2E	22.00	(1.00)
IC BP3	9V Nicad pack for IC2E	17.70	(1.00)
IC BP4	Empty case for 6 x AA Nicads	5.80	(0.75)
IC BP5	11·5V Nicad pack for IC2E	30.50	(1.00)
IC DC1	12V adaptor pack for IC2E	8.40	(0.75)
IC ML1	10W booster	49.00	(1.00)

YAESU MUSEN

FT 902DM	160–10m 9 band receiver	885.00	—
FC 902	All band ATU	135.00	(1.50)
SP 901	External speaker	31.00	(1.50)
FT 101Z	160–10m 9 band transceiver (FM)	590.00	—
FT 101ZD	160–10m 9 band transceiver (FM) digital ro	665.00	—
DCT 101Z	DC/DC power pack	42.55	(1.50)
FAN 101Z	Cooling fan for 101Z	13.80	(0.75)
FT 707	8 band transceiver 200W PEP	569.00	—
FT 707S	8 band transceiver 20W PEP	485.00	—
FP 707	Matching power supply	125.00	(5.00)
FV 707R(2)	Transverter – 2m	198.00	—
FV 707DM	Digital VFO	203.00	—
FC 707	Matching ATU/power meter	85.00	(1.00)
MR 7	Metal rack for FT 707	13.70	(1.00)
MMB 23	Mobile mounting bracket for FT 707	16.10	(1.00)
FRG 7	General coverage receiver	189.00	—
FRG 7700	200kHz–30MHz general coverage receiver	329.00	—
FRG 7700M	As above but with memories	409.00	—
FRT 7700	Antenna tuning unit	37.85	(1.00)
FT 208R	2m FM synthesised handheld	209.00	—
FT 708R	70cm FM synthesised handheld	219.00	—
NC 7	Base trickle charger	26.85	(1.30)
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NC 9C	Compact trickle charger	8.00	(0.75)
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FNB-2	Spare battery pack	17.25	(0.75)
PA-3	12V dc/dc adaptor	13.40	(0.75)
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FT 780R	70cm synthesised multimode (1·6MHz shift)	459.00	—
FP 80	Matching 230V ac power supply	63.00	(1.50)
FT 290R	2m portable synthesised multimode	249.00	—
MMB 11	Mobile mounting bracket	22.25	(1.00)
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NC-11C	240V ac trickle charger	8.05	(0.75)
FL 2010	Matching 10W linear	64.40	(1.20)
Nicads	2.2 amp/hr Nicads each	2.50	—
FL 2100Z	160–10m 1200W linear	425.00	(5.00)
FF 501DX	HF low pass filter 1kW	23.00	(0.75)
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YH 77	Lightweight headphones 8 ohm	10.00	(0.75)
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YM 24A	Speaker/mic 207/208/708	16.85	(0.75)
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YM 38	As 34 but up/down scan buttons	24.90	(1.50)

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Multi 750E	2m multimode mobile	289.00	—
Expander	70cm transverter for M750E	219.00	—

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C78 70cm FM
£219 inc VAT & carr.

STANDARD VHF/UHF

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CPB 78	10W matching linear	67.50	(1.50)
C 58	2m multimode portable	239.00	—
CPB 58	25W matching linear	79.50	(1.50)
CM 8	Mobile bracket	19.95	(1.00)
CL 8	Soft carrying case	6.95	(0.75)
C 12/230	Charger	7.59	(0.75)

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Shure 526T MkII	Power microphone	39.95	(1.50)
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Adonis AM802	Compression mic + meter 3 o/p	59.00	—

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Adonis AM202S	Clip-on	20.95	—
Adonis AM202F	Swan neck + up/down buttons	30.00	—
Adonis AM202H	Head band + up/down buttons	30.95	—

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Yaesu YE7A/YD846 600/5k imp	5.75	(0.75)
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for 70cm
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Welz SP200	HF/2m	59.00	(0.75)
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Welz SP400	2m/70	59.00	(0.75)
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DL 600	SO239 600W max	29.95	(1.50)
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ASP/B	Auto RF speech clipper (Trio plug)	79.35	—
ASP/A	Auto RF speech clipper (Yaesu plug)	79.35	—
D 75	Manually-controlled RF speech clipper	56.35	—
RFC/M	RF speech clipper module	26.45	—
D 70	Morse tutor	49.45	—
AD 270	Indoor active dipole antenna	37.95	—
AD 370	Outdoor active dipole antenna	51.75	—
MPU 1	Mains power unit	6.90	—

D70
MORSE TUTOR
£49.45 inc VAT & carr.

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MMT 432/28S	70cm transverter for HF rig	149.00	—
MMT 432/144R	70cm transverter for 2m rig	184.00	—
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MMT 1296/144	23cm transverter for 2m rig	184.00	—
MML 144/25	2m 25W linear amp (3W i/p)	59.00	—
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MML 144/100S	2m 100W linear amp (10W i/p)	129.00	—
MML 432/20	70cm 20W linear amp (3W i/p)	77.00	—
MML 432/50	70cm 50W linear amp (10W i/p)	119.00	—
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MM 2000	RTTY to TV converter	169.00	—
MM 4000	RTTY transceiver	269.00	—
MMC 50/28	6m converter to HF rig	27.90	—
MMC 70/28	4m converter to HF rig	27.90	—
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MMC 432/28-S	70cm converter to HF rig	34.90	—
MMC 432/144S	70cm converter to 2m rig	34.90	—
MMC 435/600	70cm ATV converter	27.90	—
MMK 1296/144	23cm converter to 2m rig	59.80	—
MMD 050/500	500MHz digital frequency meter	69.00	—
MMD 600P	600MHz prescaler	23.00	—
MMD P1	Frequency counter probe	11.50	—
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MMA 144V	2m RF switched preamp	34.90	—
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MMS 1	The Morse talker	99.00	—

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HK 704	Deluxe up/down key	14.50	(0.50)
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EKM 1A	Matching side monitor	10.95	(0.50)
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KR 400RC Kenpro (HF) complete with lower clamps	99.95	(2.50)
KR 600RC Kenpro (med HF) complete with lower clamps	139.95	(3.00)

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Yaesu low pass filter FF501DX 1kW	22.25	(0.75)
HP4A high pass filter TV down lead	5.95	—

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so here are a couple which we have made for your benefit.
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2. Bernie G4AOG will also be brewing up... in his case some exciting new flavours for our product range... and, right now, in addition to the expected full selection of radio equipment by ALL the leading makers, you will find...

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Made by one of the world's electronics giants, this unique HF communications receiver is as easy to use as a calculator, and so compact you can slip it into your briefcase. Yet, its combination of keyboard entry and LCD provides exact, drift-free reception right across its range, AM/SSB/CW, 150kc-30MHz and FM 76-108MHz, and allows no less than six station memories.

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How many other rigs do YOU know with a Gasfet in the front end? Also, *our* FT-780s are fitted with a 1·6MHz shift, so no need to programme two VFOs.

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What's more, it's made for us in Britain by WOOD & DOUGLAS, who are building up a tremendous reputation internationally for high-quality design and construction.

Just look at all these features:

- 2-channel input from video camera or recorder in B/W or colour (switchable on front panel)
- Separate gain controls on both input channels
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- Built-in receive converter – just connect direct to UHF TV for instant ATV reception
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- Video transmitter gives full 3w PSP output • Spurious better than 50dB down
- Unit housed in steel case and constructed on high-quality fibreglass PCB
- Full range of matching accessories available soon

Just look at the price ONLY £119

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The ultimate in HF mobile transceivers from Yaesu. All the new bands, and all the latest technology.

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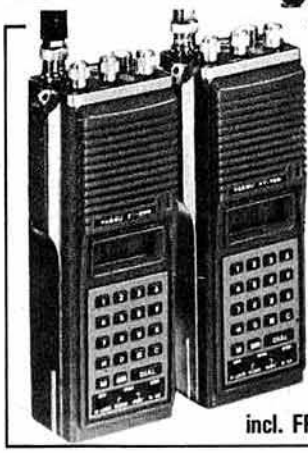


FT-208R/FT-708R

Yaesu's marvellous new hand-held for either 2m or 70cm operation. Its LCD display (with night-lamp feature) is coupled to a 4-bit microprocessor giving 10 memories, up/down scanning in 12·5/25/50kc steps (manual or auto) plus memory scan and scanning between two desired frequencies, priority channel with search-back, keyboard entry allowing split frequency for non-standard repeaters... and lots more.

PHONE FOR PRICES

incl. FREE 12V DC to DC CONVERTER

YAESU's LATEST . . . the all-mode portable FT-290R

So many features ★ 10 memories ★ Memory scan ★ 2 VFOs ★ Band scan ★ Clarifier ★ FM/LSB/USB/CW ★ LCD readout ★ Real S-meter ★ Priority channel ★ 2.5W out

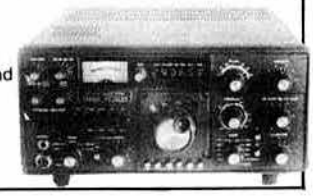
£249 inc FREE ¼-WAVE FLEXI ANTENNA

How about teaming it up with a MICROWAVE MODULES 25W amp to bring it up to base station specification? The cost . . . just £59

FT101 Mk III

The tried and tested Yaesu HF base station, now with audio peak filter and reject notch filter as standard, and choice of AM or FM.

PHONE FOR PRICES incl. FREE cooling fan and mic.



NEW

FT-ONE

Yaesu's latest HF rig that's going to set the standard for all the rest. Incorporating probably the finest receive section ever built into a Yaesu transceiver, the FT-ONE has so many features . . .

- Solid state all-mode, AM/FM/SSB/CW/RTTY
- General coverage receive and transmit 150kHz-30MHz
- Synthesised tuning and auto-scanning facility
- VFO or keyboard entry
- 10 VFOs
- No band switching
- IF shift and width control
- Audio Peak Filter
- Notch Filter
- Advanced variable threshold noise blanker
- 300 or 600Hz, 2,400-300Hz, 6kHz, 12kHz
- Built-in Curtis keyer
- Built-in SWR bridge
- Memory facility
- Full break-in and variable decay on front panel
- 2 FSK widths
- Mains or 12V

2 NORTHFIELD ROAD, EALING, LONDON W13 9SY Tel: 01-579 5311
Closed Wednesday, but use our 24-hour Ansafone service
So easy for Overseas visitors—Northfields is just seven stops from Heathrow on the Piccadilly Line!

136 GLADSTONE STREET, ST HELENS, MERSEYSIDE. Tel: 0744 53157
Our North West branch run by Mike (G8EWU)
Just around the corner from the Rugby Ground

NEW BRANCHES SPECIAL OFFER

WE ARE PROUD to announce the opening of two new branches, and would be so delighted if you went along and said hello to Ian G3PRR in Grimsby or Peter G4GSA in Stoke who for the fortnight Monday January 4th until Saturday January 16th, will be, for personal callers only, offering

FIVE PER CENT OFF OUR LIST PRICE

(see "Free Finance" section for eligible items).

SMC SERVICE

Free Finance on many items. Two year guarantee on Yaesu. Free Securicor on major Yaesu items. Access and Barclaycard over the telephone. Biggest Branch, Agent and Dealer network. Ably staffed, courteous, Service Department. "B Services" Securicor contract at £3.50!! Biggest stocks of amateur equipment in UK. Twenty-two years experience.

FREE FINANCE

On regular priced items from: Yaesu, Ascot SMCHS, CDE, HyGain, Channel Master, Hansen, SMC, MFJ, KLM, Mirage and Hi-Mound, on invoices over £100 SMC offers Free Finance! How is it done? Simple, pay 20%, split the balance equally over 6 months or pay 50% down and split the balance over a year. You pay no more than the cash price!!

GUARANTEE

Yaesu's *own* warranty does not extend outside Japan. Repairs are the responsibility of the UK dealer selling the set. SMC's two year guarantee is backed, as UK distributors, by daily contact with the factory and many tens of thousands of pounds of spares and test equipment. Avoid hawkers offering sets without serial numbers, spares, service or advice back-up.

The FT-ONE is the culmination of an all-out design project, without the usual cost constraints, a revolutionary blend of computer and RF technology.

GENERAL COVERAGE, ALL SOLID STATE
The FT-ONE is a full-coverage all mode transceiver, equipped for reception between 150kHz and 29.99MHz, and transmission on all nine amateur bands. For commercial use the FT-ONE may be programmed to transmit throughout 1·8-29·99MHz range.

KEYBOARD FREQUENCY ENTRY
Fully digitally synthesized, the FT-ONE uses a front panel keyboard for initial frequency entry. Frequency change is then accomplished via the main tuning dial or the pushbutton scanner, with tuning in either 10Hz or 100Hz steps. The FT-ONE permits extremely fine tuning and instantaneous band changes.

DUAL VFO SYSTEM
Ten digital VFO's with memory are provided, in conjunction with an A-B selection scheme that allows instant recall of any transmit, receive, or transceiver frequency. For split-frequency operation, the operator may select TX on VFO-A and RX on VFO-B, automatically storing the calling and listening frequencies. For net operations, a non-volatile memory board is available as an option, (eliminates the possibility of dumping).

FULL CW BREAK-IN
Recent advances in solid-state technology have made full CW break-in reliable enough to be incorporated into the FT-ONE. You can select traditional semi-break-in (for use with amplifiers not equipped for full break-in) or full high-speed break-in.

SWITCHING REGULATED SUPPLY
Extremely compact and light in weight, the switched mode power supply reduces substantially the space required to produce the operating voltages used in the FT-ONE. It is highly efficient, uniquely stable and provides superb reliability.

'ELITE' CLASS PERFORMANCE
In addition to the full break-in and superb receiver filters, the FT-ONE is packed with subtle virtues that others might have overlooked. Rear panel jacks allow the use of both an external receiver and an independent receive antenna, when scanning, automatic halting on a received signal may be programmed, an optional Curtis 8044 keyer board is available, and there is even a microphone squelch (AMGC) to reduce background noise pickup between words and sentences!

GAIN/INTERCEPT OPTIMIZED RECEIVER
Utilizing up-conversion with a first IF of 73MHz, the FT-ONE RF amplifier stage uses push-pull power transistors configured to produce a typical output intercept of +40dBm. The first mixer utilizes a diode ring module followed by a low noise post amp, for optimum noise figure consistent with modern day intercept requirements. The result is a receiver with a typical two-tone dynamic range well in excess of 95dB (14MHz, CW bandwidth). Additional gain tailoring is provided via a PIN diode attenuator controlled from the front panel.

FILTER READY FOR COMPETITION
Three filter bandwidths are available for CW operation (two for FSK!), using optional 600Hz or 300Hz crystal filters. Filter insertion losses are equalised and an audio peak and notch filter is standard. Both IF Shift and Variable Bandwidth are provided, and two CW filters may be cascaded, for competition-grade selectivity. For SSB work, the Variable Bandwidth feature eliminates the need for costly 1·5kHz or 1·8kHz filters.

EXPANDED OPERATING DISPLAYS
Digital displays for the VFO frequency, memory channel, and RIT offset are provided. The large front panel meter provides easy viewing of transceiver operating parameters, including finals collector current, input voltage, FM discriminator, processor compression, and forward/reflected relative power.

NON OPTIONS
Remember with your FT-ONE the noise blanker, speech processor and power supply are all built-in, not options.

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Redcar	Simon	G4EQS	(0642) 480808
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Swansea	Peter	GW8EBB	(0792) 872525
Buckley	Howarth	GW3TMP	(0244) 549563

FREE FINANCE AVAILABLE PLUS 2-YEAR SMC GUARANTEE

FT101ZD £635 inc VAT @ 15% & SECURICOR

- ★ 160–10 metres including new allocations
- ★ Variable IF bandwidth 2·4kHz down to 300Hz
- ★ 8 pole filters for razor edge selectivity
- ★ Selectable CW fixed bandwidth CW-W and CW-N
- ★ Semi-break in with sidetone for excellent CW
- ★ Digital plus analogue frequency displays
- ★ 6146B PA's with 6dB of negative feedback
- ★ 180W PIP and −31dB 3rd order intermod
- ★ RF speech processor fitted, adjustable level
- ★ VOX built-in and is adjustable from the front panel
- ★ Wide dynamic range for big signal handling
- ★ High usable sensitivity, for those weak ones
- ★ Superb noise blanker, adjustable threshold
- ★ Attenuator: 0–10 20dB, front panel switch
- ★ AGC: slow-fast-off, front panel switchable
- ★ Clarifier (RIT) switchable on Tx, Rx or both
- ★ Low level transverter drive output facility
- ★ Universal power supply 110–234V ac and 12V dc
- ★ Incredible range of matching accessories
  6 modes, Digital/Analogue — AM/FM options

*Option

FT902DM £885 inc VAT @ 15% & SECURICOR

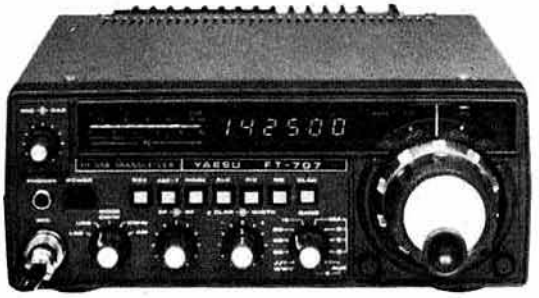
- ★ 160–10 metres including new allocations
- ★ Variable IF bandwidth 2·4kHz down to 300Hz
- ★ Audio Peak and independent notch controls
- ★ AM, FSK, USB, LSB, CW, FM (Tx and Rx)
- ★ Semi break in, inbuilt Curtis IC keyer
- ★ Digital plus analogue frequency displays
- ★ 6146B's with negative feedback
- ★ VOX built-in and adjustables
- ★ Instant write in memory channel
- ★ Tune-up button (10 sec, of full power)
- ★ Curtis Keyer—lambic, single or straight
- ★ Switchable AGC and RF attenuator
- ★ Optional 350 or 600Hz CW, 6kHz, AM filters
- ★ Clarifier (RIT) switchable on Tx, Rx or both
- ★ Audio Peak and tunable notch filter
- ★ Plug-in modular, computer style constructor
- ★ Fully adjustable RF Speech processor
- ★ Ergonomically designed with necessary LEDs
- ★ Incredible range of matching accessories
- ★ Universal power supply 110–234V ac and 12V dc

*Option

FT107M £725 inc VAT @ 15% & SECURICOR

- ★ 160–10 metres (including 10, 18 and 24MHz)
- ★ USB-LSB-CWW-FSK-AM multi-mode
- ★ Full broad band "no tune" power amplifier
- ★ 240W PIP. 75 per cent power output at 3·1 VSWR
- ★ 12 memory channels with clarifier on memory
- ★ Digital Memory Shift gives offset from memory
- ★ Up/down scanning control from the microphone
- ★ Variable IF bandwidth—16 poles of selectivity
- ★ Bandwidths: 6kHz*, 2·4kHz, 300Hz, 600Hz, 300Hz*
- ★ Selectable CW "fixed" widths CW-W and CW-N*
- ★ Tunable Audio Peak (AFP) and Notch filter
- ★ Diode ring mixer for very high Rx dynamic range
- ★ Noise blanker—front panel adjustable threshold
- ★ AGC: slow-fast-off switchable from the front panel
- ★ Attenuator 0·20dB, plus RF gain on front panel
- ★ RF speech processor fitted—front panel adjustable
- ★ Digital (100Hz) plus analogue frequency displays
- ★ Meter Reads: Vcc, Ic, AFC, Compression and SWR
- ★ Semi break-in with side tone, Vox built-in
- ★ Choice of built-in or separate power supply units

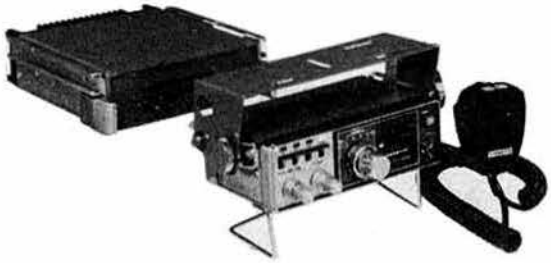
*Option



FT707 £569 inc VAT @ 15% & SECURICOR

- ★ 80–10 metres (including 10, 18 and 24MHz bands)
- ★ USB, LSB-CWW, CWN, AM (Tx and Rx operation)
- ★ 100W PEP, 50% power output at 3:1 VSWR
- ★ Full "broad band" no tune output stage
- ★ Excellent Rx dynamic range, power transistor buffers
- ★ Rx Schottky diode ring mixer module
- ★ Local oscillator with ultra low noise floor
- ★ Variable IF bandwidth—16 crystal poles
- ★ Bandwidths 3kHz*, 2·4kHz, 300Hz, 600, 350Hz*
- ★ AGC: slow-fast switchable from the front panel
- ★ VOX built-in and adjustable from the front panel
- ★ Semi break in with side tone for excellent CW
- ★ Digital (100Hz) plus analogue frequency display
- ★ LED level meter reads S, PO and AEC
- ★ Convenient concentric AE, TR gain controls
- ★ Indicators for calibrator, fix, and ext VFO
- ★ Receiver offset tuning (RIT chamber) control
- ★ Advanced noise blanker with local loop AGC
- ★ 25kHz crystal calibrator feature
- ★ Internal, xtal or external VFO control

*Option



FT720RV £245 inc VAT @ 15% & SECURICOR

FT720 Control Head
- ★ Four easy write-down memory channels
- ★ Rx Priority channel (auto check)
- ★ Scanning, band/memory, empty/busy
- ★ Up/down tuning/scanning from mic.
- ★ Optically coupled tuning control
- ★ Manual and automatic tone burst
- ★ String LEDs for 'S' and PO7 status LEDs
- ★ 1½W of audio to internal/external speaker
- ★ 3·3 (4·3)" D × 6" W × 2 (2·2)" H

720RV 10W deck. **720RVH** 25W deck
- ★ 144–146MHz (144–148MHz possible)
- ★ 12½kHz synthesizer steps, 600kHz shift
- ★ 0·3μV for 20dB quieting
- ★ Rx 0·5A, Tx RV 3·5A, RVH 6·5A
- ★ 5·8 (6·5)" D × 6" W × 2 (2·2)" D

720RU 10W, 70cm, deck
- ★ 430–434MHz
- ★ 25kHz synthesizer steps, 1·6MHz shift
- ★ 0·5μV for 20dB quieting
- ★ Rx 0·5A, Tx 4·5A
- ★ 5·8 (6·5)" D × 6" W × 2 (2·2)" D

S72 Switching box
- ★ Pushbutton band change
- ★ Auto change of steps/splits

FT290R £249 inc VAT @ 15% & SECURICOR

- ★ 144–146MHz (144–148 possible)
- ★ Multimode USB, LSB, FM, CW
- ★ 2·5W PEP, 2·5W RMS/300mW
- ★ LED's, "ON AIR", "BUSY"
- ★ Moving coil meter for S & PO
- ★ Integral telescopic antenna
- ★ Width 2·4kHz & 14kHz @ 6dB
- ★ Optically coupled main tuning
- ★ 100Hz backlite LCD display
- ★ 10 memory channels
- ★ "Five year" memory backup
- ★ FM: 25kHz and 12·5kHz steps
- ★ SSB: 1kHz and 100Hz steps
- ★ Any Tx/Rx split with dual VFOs
- ★ ±600kHz split, 1,750kHz burst
- ★ Mobile bracket available
- ★ Matching 10W linear Amplifier
- ★ Up/down tuning from mic
- ★ AF output 1W @ 10% THD
- ★ 58(H) × 150(W) × 195(D) (1·3kg)
- ★ Rx, 0·70mA, Tx 800mA (FM max)
- ★ 8 "C" Nicads or Drys Internal
- ★ 8·5 15·2V DC External
- ★ Scan on memory (+10kHz)"
- ★ Long battery life SMC 2·2A/Hr

FREE FINANCE AVAILABLE PLUS 2-YEAR SMC GUARANTEE

FT480R (2m) FT780R (70cm)

- ★ USB LSB CW FM (A3j, A1, 13).
- ★ 30W PEP A3j, 10/1W out A1/F3
- ★ Bandpass filter no tune design
- ★ Bandwidth 2·4kHz & 14kHz @ −6dB
- ★ Semi break in with side tone
- ★ Very bright blue 100Hz digital display
- ★ Display shows Tx ÷ Rx freq (inc RIT)
- ★ String LED display for "S" and PO
- ★ Digital receiver offset tuning
- ★ Advanced effective noise blanker
- ★ Memory scanning with slot display
- ★ Up/down tuning/scanning from mic
- ★ Priority channel on any memory slot
- ★ Satellite mode allows tuning on Tx
- ★ Scanning for busy or clear channels
- ★ Size (case): 8·3" D, 2·3" H, 6·9" W
- ★ LED's, "On Air", Clar, Hi/Low, FM mod
- ★ Matching FP80 Mains PSU available

FT480R

FT480R £379 inc VAT @ 15% & SECURICOR

- ★ 144–146MHz (143·5–148·5MHz possible)
- ★ Excellent dynamic range sensitivity
- ★ FM, 25, 125, 1kHz steps
- ★ SSB: 1,000, 100, 10Hz steps
- ★ Any Tx/Rx split with dual VFO's
- ★ ±600kHz standard repeater split
- ★ Four easy write in memory channels

FT780R £449 inc VAT @ 15% & SECURICOR

- ★ NMOS four bit micro control
- ★ 430–434MHz (440–445MHz possible)
- ★ GaAs Fet RF for incredible sensitivity
- ★ FM; 100kHz, 25kHz, 1kHz, steps
- ★ SSB; 1,000, 100, 10Hz steps
- ★ Repeater access by use of dual VFO's
- ★ Four easy write in memory channels

1·6MHz shift now available

FT780R

FRG7 £199 inc VAT @ 15% & SECURICOR

- ★ "Industry Standard" value for money Rx
- ★ 30MHz-500kHz in One MHz bands
- ★ SSB (LSB/USB), CW, AM
- ★ Sensitivity AM; 0·7μV 10dB S/N at 30%
- ★ Selectively ±3kHz at −6dB
- ★ Stability; 500Hz after 30 minutes
- ★ Triple conversion, drift cancelling
- ★ Direct frequency readout to 5kHz
- ★ Fine tuning control
- ★ AGC; DC amplified, 3 stage control
- ★ AF; Powerful 2 watts of audio
- ★ Forward facing internal speaker
- ★ Record socket "volume independent"
- ★ Well calibrated "sharp" preselector
- ★ AM automatic noise suppression circuit
- ★ Antenna Hi to 1·6MHz, 50 ohm to 30MHz
- ★ 3 position RF attenuator
- ★ 3 position AF filter (LP, WBP, NBP)
- ★ 110/240V ac and 12V dc
- ★ Lights; battery economy switch
- ★ Illuminated edge type "S" meter
- ★ 2 IC, 9 FET, 13 Tr, 16D (9Ge, 5Si, 2Z)
- ★ Weight; 7kg (without batteries)
- ★ Dimensions: 340 (W) × 153 (H) × 285 (D) mm
- ★ Optional battery holder

FRG7700 £329 inc. VAT @ 15% & SECURICOR

- ★ Wide coverage, *all* mode receiver
- ★ 30MHz down to 150kHz (and below)
- ★ 12 channel memory option with fine tune
- ★ SSB (LSB/USB), CW, AM, FM
- ★ 2·7kHz, 6kHz, 12kHz, 15kHz, @ −6dB
- ★ 3 Selectivities on AM, squelch on FM
- ★ Up conversion, 48MHz first IF
- ★ 1kHz digital, plus analogue, display
- ★ Inbuilt quartz clock/timer
- ★ No preselector, auto selected LPF's
- ★ Advanced noise blanker fitted
- ★ Antenna 500ohm to 2MHz, 50ohm to 30MHz
- ★ 20dB pad plus continuous attenuator
- ★ Constantly variable tone control
- ★ 110 and 240V ac and 12V dc option
- ★ Switchable speed A.G.C. system
- ★ Signal meter calibrated in "S" and SIMPO
- ★ Accessories; Tuners, Converters, LPF, Memory
- ★ FRT7700; 150kHz–30MHz, Attenuator, Switch etc.
- ★ FRV7700A; 118–130, 130–140, 140–150MHz
- ★ FRV7700B; 118–130, 140–150, 50–59MHz
- ★ FRV7700C; 140–150, 150–160, 160–170MHz
- ★ FRV7700D; 118–130, 140–150, 70–80MHz
- ★ FF5; 500kHz (for improved VLF reception)
- ★ MEMGR7700; 12 Channels (easy internal fitting)

FREE FINANCE AVAILABLE PLUS 2-YEAR SMC GUARANTEE

FT208R (2m) FT708R (70cm)

- ★ 4 bit CPU chip frequency control
- ★ Keyboard entry of frequencies/splits
- ★ LCN digital display with backlight
- ★ Ten channels of memory
- ★ Memory back up five-year lifetime cell
- ★ Up/down manual tuning
- ★ Manual or auto scan for busy/clear
- ★ Priority channel with search back
- ★ Memory scanning feature
- ★ Scan between any two frequencies
- ★ Auto scan restart
- ★ Quick change NiCad pack
- ★ 1,750Hz tone burst
- ★ Built in condenser microphone
- ★ 500mW AF to int/ext speaker
- ★ External speaker/mic available
- ★ Keyboard offers 16 tone DTMF
- ★ 168(H) × 61(W) × 39(D)mm
- ★ C/w NiCad pack, helical

FT208R £209 inc. VAT @ 15% & SECURICOR

- ★ 144–148MHz (144–148 possible)
- ★ 12·5/25kHz synthesizer steps
- ★ Any split + or − programmable
- ★ ±600kHz repeater split
- ★ 2·5 or 0·3W RF output
- ★ Rx: 20mA squelch 150mA max AF
- ★ Tx: 800mA at 2·5W RF
- ★ 0·25μV for 12dB SINAD
- ★ Dual conversion 16·9MHz and 455kHz

FT708R £219 inc. VAT @ 15% & SECURICOR

- ★ 430–440MHz (440–450 option)
- ★ 25kHz synthesizer steps
- ★ Any split + or − programmable
- ★ ±7·6MHz EU split standard
- ★ 1W or 100mW RF output
- ★ Rx: 20mA squelch, 150mA (max AF)
- ★ Tx: 500mA at 1W RF
- ★ 0·4μV for 12dB SINAD
- ★ Dual conversion 46·255MHz and 455kHz

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Tandragee	Mervyn	GI3WWY	(0762) 840656	Redcar	Simon	G4EQS	(0642) 480808	Swansea	Peter	GW8EBB	(0792) 872525
Edinburgh	Jack	GM8GEC	(031665) 2420					Jersey	Geoff	GJ4ICD	(0534) 26788

ASCOT

These are a complete range of mobile antenna accessories developed and manufactured in the UK.

They are extremely rugged, designed to with stand extremes of weather using: fine stainless steel whips, A100 nylon bases, chrome plated brass ferrules, heat treated silver plated beryllium copper contacts and polished stainless steel shock springs.

From the list below, choose the base (¼, ⅝, ½) choose the whip (long or short) and the cable assembly required (cable or magnetic). Then add an accessory if required.

340	Base. Stand 1/4λ 60-550MHz	**£2.30**	£0.40
310	Base. Swivel 1/4λ 60-550MHz	**£4.20**	£0.40
344	Base. Sprung 1/4λ 60-120MHz	**£6.50**	£0.52
440	Base. Stand 5/8λ 145MHz	**£2.70**	£0.40
330	Base. Swivel 5/8λ 145MHz	**£5.00**	£0.40
341	Base. Sprung 5/8λ 145MHz	**£7.30**	£0.52
350	Base. Fine tune 1/2λ 145MHz	**£7.30**	£0.52
351	Base. Sprung 1/2λ 145MHz	**£8.05**	£0.63
057	Whip, tapered SS 127cms	**£1.95**	£0.98
056	Whip, parallel SS 63cms	**£0.75**	£0.75
085	Mount cable 5/8 & 1/4λ	**£3.05**	£0.63
085LR	Mount cable 5/8 & 1/4λ	**£3.85**	£0.63
092	Mount Mag. 5/8 & 1/4λ	**£10.75**	£0.86
084	Mount cable 1/2λ	**£5.00**	£0.63
088	Mount cowl 1/2λ	**£5.75**	£0.40
091	Mount Magnetic 1/2λ	**£10.75**	£0.86
089	Gutter clip adaptor	**£5.00**	£0.63
093	Boot lip adaptor	**£3.80**	£0.52

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown, max £1.73

hy-gain

The TH3jnr is a 3 element triband (10-15-20m) beam whose compact design (longest element 24·2ft, boom 12ft turning radius 14·3ft) makes it ideal where space is the limiting factor. Separate and matched air dielectric Hy-Q traps are used for each band giving a 52ohm fed with a 1·5:1 VSWR at resonance, 8dB Av gain, 25dB F.B. ratio and a power handling of 600W P.E.P. By using a 1¼in boom the antenna presents only 3·4sq ft of surface area (equals 87lb of load at 80mph). The mast to boom clamp accepts 1-1¾in masting and, like all the hardware, is Iridite treated to mil specs.

12AVQ	Vertical 10-20m inc.	**£43.13**	£1.73
14AVQ/WB	Vertical 10-40m inc.	**£58.08**	£1.73
18AVT/WB	Vertical 10-80m inc.	**£90.85**	£1.73
14RMQ	Roof mounting Kit	**£30.48**	£1.73
18V	Vertical 10-80m inc.	**£31.97**	£1.73
18HT	"HY Tower" 10-80m	**£320.85**	£12.54
103BA	3 Ele Yagi 10m	**£60.38**	£1.73
105BA	3 Ele Yagi 10m	**£112.70**	£3.16
153BA	3 Ele Yagi 15m	**£74.75**	£2.36
155BA	5 Ele Yagi 15m	**£135.13**	£4.77
203BA	3 Ele Yagi 20m	**£159.85**	£3.97
204BA	4 Ele Yagi 20m	**£217.35**	£5.87
205BA	5 Ele Yagi 20m	**£281.75**	£7.59
402BA	2 Ele Yagi 40m	**£201.25**	£5.23
DB10/15A	3 Ele Yagi 10-15m	**£146.05**	£3.91
TH3JNR	3 Ele Yagi 10-15-20m	**£159.28**	£2.47
TH2MK3	2 Ele Yagi 10-15-20m	**£136.85**	£2.59
TH3MK3	3 Ele Yagi 10-15-20m	**£205.85**	£4.66
TH5DXX	"Thunderbird" 5 Ele	**£228.85**	£5.41
TH6DXX	"Thunderbird" 6 Ele	**£281.75**	£6.97
HYQUAD	2 Ele Quad 10-15-20m	**£240.35**	£4.89
18TD	Dipole Tape 10-80m	**£80.39**	£2.30
BN86	Balun 1:1-3 30MHz	**£15.53**	£1.15
LA1	Lightning Arrestor	**TOS**	£0.75

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

J-BEAM

As well as 2m antennas featured here, the range covers 4m through 23cms. All models offer good 50ohm matches and bandwidths by incorporating such innovations as the inverse balun. Technical details are quoted in accordance with ICE (ICE138 + 138A) and I.E.E.E. (RV481 RE252 Jan 65) recommendations. (Sae for catalogue.)

The 8XY/2m is basically two 8 element yagis mounted at right angles on a common 9ft boom. It is suitable for horizontal, vertical or circular (with PMH/2c) polarisation. 9·5dB gain in each plane. 47° horizontal beamwidth, 10lb weight, 64lb wind load at 100mph an elegant answer to a single antenna installation.

JAYBEAM 2 METRE

HO/2M	Halo, head only	−3·0dB	**£5.17**	£0.63
HM/2M	Halo, 24in mast	−3·0dB	**£5.75**	£0.75
UGP/2M	Ground plane	0·0dB	**£10.92**	£1.73
C5/2M	Colinear omni vert	4·8dB	**£47.72**	£1.73
LR1/2M	Colinear	4·5dB	**£25.87**	£1.73
5Y/2M	Yagi 5 ele	7·8dB	**£12.07**	£1.73
8Y/2M	Yagi, 8 ele	9·5dB	**£15.52**	£1.73
10Y/2M	Long Yagi, 10 ele	11·4dB	**£33.35**	£1.73
14Y/2M	Long Yagi, 14 ele	13·0dB	**£42.00**	£1.73
D5/2M	Yagi, 5 over 5 slot	10·6dB	**£21.85**	£1.73
D8/2M	Yagi, 8 over 8 slot	12·3dB	**£29.32**	£1.73
PBM10/2M	10 ele parabeam	12·4dB	**£39.67**	£1.73
PBM14/2M	14 ele parabeam	13·7dB	**£48.00**	£1.73
Q4/2M	Quad, 4 ele	10·0dB	**£25.87**	£1.73
Q6/2M	Quad, 6 ele	12·0dB	**£33.92**	£1.73
5XY/2M	Yagi, 5 ele cross	7·8dB	**£24.72**	£1.73
8XY/2M	Yagi, 8 ele cross	9·5dB	**£31.05**	£1.73
10XY/2M	Yagi, 10 ele cross	11·3dB	**£40.82**	£1.73
PMH2/C	Harness, Cir. Polar		**£8.05**	£0.52
PMH2/2M	Harness, 2 way		**£10.92**	£0.86
PMH2/2ML	Hrns, 2 way long		**£11.92**	£1.15
PMH4/2M	Harness, 4 way		**£25.00**	£1.73

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

Kenpro

KR600RC
£132.25

360° round type meter
Max. load 200kg.
Rot. 600kg/cm, brake 4,000kg/m.
1½in-2½in masts
Lower casting optional.

KR400RC
£90.85

360° round type meter.
Max. load 200kg.
Rot. 400kg/cm, brake 1,500kg/cm
1½in-2½in masts.
Lower casting optional.

KR500
£86.25

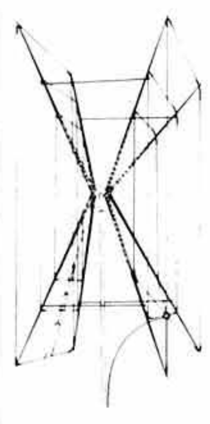
Elevation Rotator (180°).
Up to 50kg of Load.
1¾in-2¼in mast.
1¾in-1¾in boom.

KR250
£44.85

Twist and switch controller.
Rotator 200kg/cm.
Brake 600kg.
1in-1¾in masts.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

Gem Quad



A light strong, boomless, quad antenna covering 10-15-20m. The centre spider is aluminium and the spreader arms (13·6ft and 2·2lb) are of a glass fibre tri-dectic construction. (Thin rods forming a triangle with tape criss-crossing for light, rigid, low wind resistance structure.)

The double cone shape offers optimum spacing between loops and maintains these critical measurements even under severe weather conditions. This optimum spacing provides "monobander" performance; high gain, maximum capture area, low angle radiation, low SWR and good F/B and F/S ratios. The toroidal balun supplied provides single 50 ohm coaxial feed on all bands, with no lossey coils, traps or switches.

2 element 18' × 18' × 9½'; TR 9½'; 8dB Gain; 25dB F/B
3 element As 2 ele plus 6·5 boom; 8·9dB Gain; 30dB F/B.
4 element As 2 ele plus 13' boom; TR 22'.

GQ2E	2 Ele Antenna	**£142.60**	£4.31
GQ3E	3 Ele Antenna	**£215.05**	£7.42
GQ4E	4 Ele Antenna	**£286.35**	£8.11
GQCK1	Conversion Kit 1 Ele	**£72.45**	£3.34
GQCK2	Conversion Kit 2 Ele	**£143.75**	£5.41
GQSPIDER	Centre piece (spare)	**£30.19**	£1.43
GQSPREADER	Spreader Arm (spare)	**£11.33**	£1.73

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

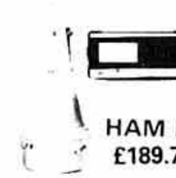
CDE

AR40
£65.55

Accurate, silent self calibrating control box. Dial up desired beam heading, push knob; motor rotates to that position and then switches off.

CD45
£113.85

Large illuminated meter gives read out of antenna heading at all times. Armature brake. Low voltage meter. Handles antennas to 8½sq ft.



HAM IV
£189.75

Large illuminated meter gives read out of antenna heading at, all times. wedge solenoid brake mechanism. Handles antennas to 15sq ft.

T2X
£270.25

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 30sq ft.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

SOUTH MIDLANDS COMMUNICATIONS LIMITED

BRANCHES: CHESTERFIELD · HUMBERSIDE · STOKE · LEEDS · WOODHALL SPA

VERSATOWER

TELESCOPIC & TILTOVER RADIO TOWERS

BEST BUYS LOW COST TOWERS

NEW

18FT ONLY £112.70

28FT ONLY £169.90

With tiltover base for ease of installation. These are our latest light duty range.

Or for larger headloads and heights we recommend our post mounted series P60 shown on the far left.

STANDARD
Post mounting

13M20P40 40′ £396.75
13M20P60 60′ £485.30

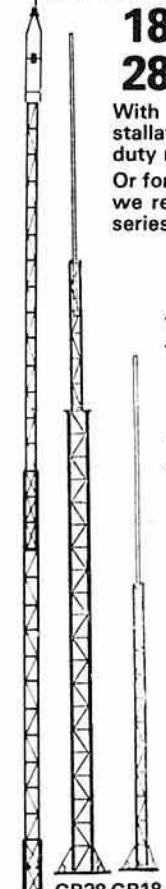
HEAVY DUTY
Post mounting

16M20P60 60′ £671.60
16M20P80 80′ £1012.00

Twelve years of continuous development has produced a range of over 50 models, all of which, being made in England conform to the current B.S.S., requiring minimum designed wind speeds of 85mph and up to 117mph.

Before purchasing a Tower, we strongly recommend consulting one of our engineers for advice regarding the most suitable combination for an installation. *It would be incorrect to nominate a specific headload as this is dependent upon load distribution, geographical location and siting.*

The range encompasses towers between 25 and 120ft in 10, 20 or 40ft sections mounted on ground post, base plate, wall, fixed base or high speed trailer.



CB28 CB18

SEND NOW FOR SPECIFICATIONS/PRICES

'30ft': 10ft SECTION "MINITOWER"

Capable of supporting a HF beam or several VHF Ants. The head unit accepts 2" tube and provides for a rotator. Operation is easy with single winch system.

10M10P30 Post mount	£353.05
10M10W30 Wall mount (LG1013W extra)	£339.25
10M10BP30 Base Plate (HD Bolts extra)	£373.75
10M10FB30 Fixed base (HD Bolts extra)	£327.75

NB: PRICES INCLUDE VAT (AT 15%)
DELIVERY EXTRA (distance dependent)

HANSEN

IN LINE POWER/SWR BRIDGES P.E.P., R.M.S. 1·8–440MHz

The Hansen range covers 20 quaity models with top-of-the-line the FS710. This is a flat frequency response, peak envelope power and R.M.S. in-line wattmeter with many novel features. Most notable being the 'power independent' SWR scale—no forward power calibration knob, just direct reading SWR.

FS710: PEP AUTO-SWR RMS LEVEL
FS710 £78.20

FS710H: 1·8 60MHz. 15,150, 1·5kW
FS710V: 50 150MHz. 15,150W
V.S.W.R: 4:1 and to 20:1
Accuracy: ±7% of FSD
Impedance: 50 52 Ohms
Connectors: SO239
Power: 240 Volts AC 50Hz
Weight: 3·lbs (1·5Kgs)
Size overall: 8 × 4 × 5½"
Size Meter: 2 × 3½"
Time Const: PEP follow 4 second

FS500 £60.95

PEAK READING LEVEL RESPONSE
FS500H 1·8 60MHz 20, 200 & 2kW
FS500V 50 150MHz 20 & 200W
Power ±7% FSD. SWR 1:1 5:1
Size: 8 × 4 × 5½"

FS600 £44.85

PEAK READING LEVEL RESPONSE
FS601M 1·8 30MHz 20 & 200W
FS601MH 1·8 30MHz 200 & 2kW
FS602M 50 150MHz 20 & 200W
FS603M 430 440MHz 5 & 20W
Power ±10% FSD. SWR 1:1 3:1
Size: 6½ × 2½ × 4½"

FS300 £40.25

LEVEL RESPONSE, LARGE METER
FS300H 1·8MHz 20, 200 1kW,
FS300V 50 150MHz 20, 200W FSD
Power ±10% SWR 1:1 3:1 ±10%
Size: 8 × 4 × 5½"

FS7 £35.65

VHF/UHF WATTMETER & BRIDGE
FS7 145MHz & 432MHz 5, 20, 200W
Power RMS ±10%. SWR 1:1 3:1
Power Max: 144MHz, 200W
432MHz 20W
Size: 6½ × 2½ × 4½". 'N' type sockets

FS711 £32.20

REMOTE INDICATOR TYPE
FS711H 1·8-30MHz 20 & 200W
FS711V 50 150MHz 20 & 200W
FS711U 430-440MHz 5 & 20W
Power ±10% SWR 1:1 3:1 ±3%
Indicator 5 × 2½ × 1½"
coupler 3½ × 2½ × 1½"

FS5E £32.20

INDEPENDENT TWIN METER
FS5E 3·5 150MHz 20, 200 & 1kW
Power RMS ±10%. SWR 1:1 5:1
Power Max: 1kW 3·5 30MHz
50W 50 150MHz
Size: 7 × 3 × 3½". 'On the Air' LED

FS300M £31.05

LEVEL RESPONSE, POWER & SWR
FS301M 1·8 30MHz 20, 200W
FS301MH 1·8 30MHz 200, 2kW
FS302M 50 150MHz 20, 200W
Power ±10%. SWR 1:1 3:1 ±3%
Size: 6½ × 2½ × 4½"

SWR3S £23.00

WIDE RANGE POWER & SWR
SWR3S 3·5 150MHz 20 & 200W
Power RMS ±10%. SWR 1:1 3:1
Power Max: 200W 3·5 30MHz
50W 50 150MHz
Size: 6 × 2½ × 2½". Antenna switch

SWR50B £23

TWIN METER, RELATIVE POWER
SWR50B 3·5 150MHz Scaled 1kW
Power RMS ±20%. SWR 1:1 3:1
Power Max: HF 1kW 1:1. 300W 3:1,
VHF 50W
Size: 6 × 2½ × 2½". 'On the Air' LED

NB· PRICES INCLUDE VAT AT 15%
Carriage free (surface post) worldwide

SMC=HS

OMNIDIRECTIONAL VERTICAL HF, VHF, UHF ANTENNAS

HF TRAPPED VERTICAL

The SMCHF5V covers five bands, 10 to 80 metres. Only 15ft 9in high, about 1½in diameter and weighing 6½lb but with PEP handling (within the 1·5:1 VSWR bandwidth) of 500W on 10 20m and 200W on 40 and 80m. It is suitable for ground mounting on a good earth stake (with or without radials) or in an elevated position with resonant wire radials or the SMCHF5R trapped radial kit.

The SMCHF5R consists of five solid rods (between 6½ft and 7½ft) sloping downwards at 45° to the antenna. It is the perfect answer to restricted locations. Power; 150W PEP, weight 4lbs.

SMCHF5V £40.25 **SMCHF5R £29.90**
(Carriage on either or both together £1.73)

2 METRE COLINEAR

144MHz, 6·5dB gain and low angle of radiation from two ⅝λ phased sections. Height 3·1 metres. Three 48cm radials project from the bottom chrome-plated brass boss. A good 50ohm match offers better than 1·5:1 VSWR at resonance for 100W PEP plus performance over 4MHz of operational bandwidth. Weatherproof design with a SO239M connector recessed 30cm up the detachable 3·2cm OD support tube. Supplied complete with mounting plate and U bolts for 1½in mast. Weight 1·5kg.

SMCGP144W (P&P £1.73) **£24.95**

70CMS COLINEAR

432MHz, 6·8dB gain and ultra low angle of radiation from three ⅝λ phased sections to a maximum height of 1·7 metres. Three 17cm radials project from the bottom chrome-plated brass boss. A good 50 ohm match offers better than 1·5:1 VSWR at resonance for 100W PEP plus performance over 10MHz of operational bandwidth. Excellent weatherproof design with a SO239M connector recessed 23cm up the detachable 3·2cm OD support tube. Supplied complete with two extruded mast clamps and U bolts capable of taking masts up to 2⅜in. Weight 1·1kg, Projected area 0·034 square metres.

SMCGP432X (P&P £1.15) **£28.00**

2 METER AND 70CMS COLINEAR

144MHz 2·8dB gain and 432MHz 5·7dB of gain single 50ohm feed. 1·1m high. 100W PEP.

SMC 70N2V (P&P £1.15) **£27.60**

VHF/UHF DISCONES

The SMCGDX1 is a vertically polarized, 3dB gain, 500W PEP, 50ohm, broad-band antenna. It is constructed of eight horizontal rods (each 40cm) radiating from a central boss, thus forming the disc, and eight rods (each 90cm) radiating from the boss but sloping downward at 45° to form the cone. This configuration produces a 1·5:1 VSWR over the range 80 to 480MHz.

The SMCGDX2 is a development of the GDX1 with every other disc rod extended by 72cm and every other cone rod extended by 1·3m. This reduces the lower frequency limit to 50MHz.

The SMCVHFL is a skeleton discone with three off 53in cone and three off 24in disc elements suitable for listening anywhere between 65 and 520MHz.

All models use a SO239M coax connector, (in the GDX versions it is recessed into an extension of the support mast—which doubles as the coaxial feed) and are supplied with mounting hardware to 1½in mast.

SMCGDX1 (P&P £1.73) **£41.40**
SMCGDX2 (P&P £1.73) **£47.96**
SMCVHFL (P&P £1.73) **£16.85**

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

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See preceding pages for complete addresses and phone numbers

MICROWAVE MODULES LTD

In this issue of *Radio Communication* we are briefly describing our entire range of top quality British-made products, so that our regular customers and the many newcomers to amateur radio can see for themselves our extensive range we have to offer.

Microwave Modules, formed in 1969, is a wholly independent British company manufacturing quality products to professional standards solely for the amateur market, and it is this dedication together with strong customer loyalty that has enabled us to go from strength to strength in expanding and diversifying our product range.

Please note the addition of four new products. Full data is available on each of these products on request.

We would like to take this opportunity of wishing all of our customers, both old and new, all the very best for the New Year.

THE ENTIRE RANGE

* NEW PRODUCT *
MMS2

This advanced Morse Trainer contains all the facilities of the MMS1 speech synthesised Morse Tutor together with the additional feature of providing talkback of morse keyed into the unit by the pupil. **Delivery from stock.**

PRICE: £155 inc VAT (P + P £2)

* NEW PRODUCT *
MML1296/10

1296MHz 10 Watt solid-state linear power amplifier. Suitable for use with our MMT1296/144 transverter.

PHONE OR WRITE FOR FURTHER DETAILS

INTRODUCTORY PRICE: £199 inc VAT (P + P £2)

TRANSVERTERS

		Price inc VAT	Post Rate
MMT28/144:	2m down to 10m	£99	B
MMT70/28:	10m up to 4m	£115	B
MMT70/144:	2m down to 4m	£115	B
MMT144/28:	10m up to 2m	£99	B
MMT432/28-S:	10m up to 70cm with satellite shift	£149	B
MMT432/144-R:	2m up to 70cm with repeater shift	£184	B
MMT1296/144:	2m up to 23cm	£184	B

LINEAR AMPLIFIERS

		Price inc VAT	Post Rate
MML28/100-S:	10m 100 watt/switchable preamp	£129.95	C
MML70/40:	4m 40 watt/preamp	£77	B
MML70/100-S:	4m 100 watt/switchable preamp	£129.95	C
MML144/25:	2m 25 watt/preamp	£59	B
MML144/40:	2m 40 watt/preamp	£77	B
MML144/100-S:	2m 100 watt/switchable preamp	£129.95	C
MML432/20:	70cm 20 watt/preamp	£77	B
MML432/50:	70cm 50 watt/preamp	£99	C
MML432/100:	70cm 100 watt	£228.65	D
MML1296/10:	23cm 10 watt	£199	B

CONVERTERS

		Price inc VAT	Post Rate
MMC28/144:	10m up to 2m	£27.90	A
MMC50/28:	6m down to 10m	£27.90	A
MMC70/28:	4m down to 10m	£27.90	A
MMC70/28LO:	4m down to 10m/LO output	£29.90	A
MMC144/28:	2m down to 10m	£27.90	A
MMC144/28LO:	2m down to 10m/LO output	£29.90	A
MMC432/28-S:	700m down to 10m	£34.90	A
MMC432/144-S:	70cm down to 2m	£34.90	A
MMC435/51:	70cm ATV down to VHF	£34.90	A
MMC435/600:	70cm ATV up to UHF	£27.90	A
MMC1296/28:	23cm down to 10M	£32.20	A
MMK1296/144:	23cm down to 2m	£59.80	B
MMK1691/137-5	1691MHz weather satellite converter	£115	B

NOTE: A letter of authority must be obtained from the Home Office before using the MMK 1691/137-5

MICROPROCESSOR PRODUCTS

MM2000:	RTTY to TV converter	£169	B
MM4000:	RTTY transceiver	£269	B
MM4000KB:	RTTY transceiver + keyboard	£299	D
MMS1:	Speech synthesised morse tutor	£115	B
MMS2:	Advanced morse trainer	£155	B
MM1000:	ASCII to morse converter	£59	A
MM1000KB:	ASCII to morse converter + keyboard	£89	C

RECEIVE PREAMPLIFIERS

		Price inc VAT	Post Rate
MMA28:	10m low noise preamp	£14.95	A
MMA144V:	2m RF switched preamp	£34.90	A
MMA1296:	23cm low noise preamp	£29.90	A

NEW PRODUCT
1690MHz WEATHER SATELLITE CONVERTER MMK1691/137-5

This converter is intended for reception of the METEOSAT weather satellite and other satellites operating in the 1690-1710 band.

PRICE £115.00 (p + p £2.00)

FULL DATA ON EACH OF THE ABOVE PRODUCTS IS AVAILABLE UPON REQUEST

VARIOUS

		Price inc VAT	Post Rate
MMD050/500:	500MHz frequency counter	£69	A
MMD600P:	600MHz ÷ 10 prescaler	£23	A
MMDP1:	Frequency counter probe	£11.50	A
MMF144:	2m bandpass filter	£9.90	A
MMF432:	70cm bandpass filter	£9.90	A
MMV1296:	70cm to 23cm varactor tripler	£34.50	A
MMS384:	384MHz frequency source	£27.60	A
MMR15/10:	15dB 10 watt attenuator	£9.90	A

* NEW PRODUCT *
MM1000
ASCII to MORSE CONVERTER

4 × 256 character memories and keyboard input buffer
SPEED RANGE: 12-30 wpm in 2 wpm increments.

PRICE inc VAT: £59 (P + P £0.80)
OR WITH KEYBOARD: £89 (P + P 2.75)

POSTAGE

The above prices include VAT but not postage. Please add postage to the above at the following rates:

UNITS 'A' = £0.80 UNITS 'C' = £2.75
UNITS 'B' = £2.00 UNITS 'D' = £3.50

ALL MICROWAVE MODULES PRODUCTS ARE FULLY GUARANTEED FOR 12 MONTHS (INCLUDING PA TRANSISTORS)

Access BARCLAYCARD VISA

WELCOME

MICROWAVE MODULES
BROOKFIELD DRIVE, AINTREE, LIVERPOOL L9 7AN, ENGLAND
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CALLERS ARE WELCOME, PLEASE TELEPHONE FIRST

HOURS: MONDAY-FRIDAY 9-12.30, 1-5.00

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RSGB SUNDAY NEWS BROADCASTS

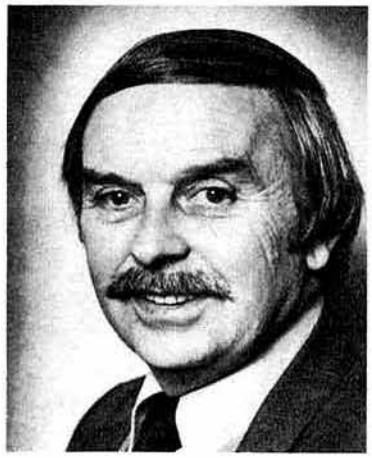
These broadcasts are made every Sunday morning, giving almost complete coverage of the British Isles. Stations broadcasting them (particulars below) use the callsign GB2RS.

The purpose of these news broadcasts is to provide an outlet for amateur radio news items which cannot wait for the next issue of *Rad Com*. Items for inclusion should reach RSGB HQ by letter (marked "GB2RS news") or telephone before 10am on Wednesdays, although no guarantee of inclusion can be given. Once broadcast, items are not usually repeated.

INTENDED RECEPTION AREA	NORMAL READER	RESERVE READER	LOCAL START TIME
Frequency: 3·640MHz. Mode: ssb			
NE Scotland	GM3HGA	GM3VEY	1130
Frequency: 3·650MHz. Mode: ssb			
SE England	G2MI	G4ARZ	0900
Midlands	G2CVV	G8QZ	0930
SW England/Wales	G8ML	G3JFH	1000
Northern Ireland	GI3GAL	GI3SXG	1030
NE England	G5VO	G3MCF	1100
E Scotland	GM4CUZ	GM4FLP	1430
Midlands	G8QZ	G2CVV/G3SZJ	1800
Frequency: 3·660MHz. Mode: ssb			
Central Scotland	GM3TCW	GM3ULP	1130
Frequency: 7·0475MHz. Mode: a.m.			
UK (from Northern Ireland)	GI3GGY	GI2DHB	0900
UK (from N Midlands)	G3LEQ	G2CVV	1100
Frequency: 144·250MHz. Mode: ssb (horizontal polarization)			
N from Carlisle	G4LAA	(Vacancy)	0930
SW from the Midlands	G3BA	G3KQF	0930
NE from S Devon	G3CHN	G3PBV	1000
NW from Manchester	G3SMT	G4IAL	1000
NNW from Cleveland	G4JJB	G8FTZ	1000
W from Carlisle	G4LAA	(Vacancy)	1030
SE from Lincoln	G3NRO	G8OFQ	1030
SW from London	G3FZL/G3VAG	G3IIR	1030
S from Aberdeen	GM8GHV/GM8MBP		1030
W from Bristol	G4CJZ	G3ZWY	1100
W from Bangor, Co Down	GI3TLT	GI3SXG	1130
Frequency: 145·525MHz (S21). Mode: fm (vertical polarization)			
Cornwall	G2ABC	G3NPB/G3VGO	0930
Hampshire, north	G8CKN	G3PZN	0930
Suffolk	G3ZNU	G4FSG/G4FZZ	0930
Leeds	G3SPX	G8XGN	0930
Co Down	GI3WEM	GI4DOR	0930
Edinburgh	GM4EHO	GM4JFS	0930
E Cornwall/S Devon	G3ZYY	G4GWJ/G4KYY	1000
Londonderry	GI2DHB	GI4AHD	1000
London	G3FZL/G3VAG	G3IIR	1000
Birmingham	G3PWJ	G3BA	1000
Lincolnshire	G3NRO	G8OFQ	1000
Tyneside	G4FUT	G3WNR	1000
Glasgow	GM4HCO	GM4CXM/GM3VTB	1000
Elgin	GM4ILS	(Vacancy)	1000
Southampton	G8LVC	G8ADM	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY/G8NNU	1030
Manchester	G3LEQ	G3JWK	1030
Dumfries	GM8TKA	GM3MSG	1100
Brighton and coast	G3ZYE/G8GEZ	G4JGJ/MA	1100
Huntingdon, Cambs	G8BBK	(Vacancy)	1100
Jersey	GJ8KNV	GJ4ICD/GJ4JWA	1100H
Gwynedd	GW4KEV	GW8TTM	1100
Clwyd/Merseyside	GW4IEQ	G8NNS	1100
Exeter	G3PBV	(Vacancy)	1130
Leicester	G4JYS	G4MFU	1130

H = horizontal polarization

A MESSAGE FROM THE SOCIETY'S PRESIDENT



It is with a mixture of pride and humility that I take on responsibility as the 48th President of the Society. I am deeply conscious of the honour of this office and of the great names who have served before me. The coming year will, I have no doubt, see many new entrants to our ranks who will be eager to learn from our knowledge. If the true spirit of amateur radio is to be preserved we must be ready and willing to assist those with limited experience of the hobby.

A rapid increase in the membership of the Society such as we have experienced in recent months brings with it its own particular problems. Headquarters staff, who are already overstretched, cannot be augmented due to lack of space, and yet the service to members must continue. This inevitably leads to delays. Your elected Council must therefore give thought to a larger headquarters to cope with this increased administration, but must also take care not to over anticipate future growth.

Without voluntary effort the Society would not thrive, and I take this opportunity to thank representatives, committee members, honorary officers, QSL sub-managers and many others who give freely of their time in the service of the Society.

The coming year will no doubt present problems, but with a united approach we have the strength to overcome these.

My sincere good wishes to you all for 1982.

Jack Anthony, G3KQF

QTC
Amateur radio news

When did you join the RSGB?

In 1976 the Society changed from manual to computerized records. At that time well over 1,000 members in the old manual records system did not have a properly recorded year of joining, and thus, for convenience, the year of joining was assumed in the transfer process. If you look on your *Radio Communication* address label, just in front of your callsign or RS number is the month and year in our records in which you joined the RSGB.

If the year requires correction, please advise the secretary in writing. Please substantiate the request for a change by enclosing a photocopy of your membership certificate. If your membership lapsed and you subsequently renewed, the year of rejoining is the one for our records.

Planning permission

Members of the RSGB are reminded that a free booklet is available to them on how to go about applying for planning permission for towers and masts. As a back-up to this booklet, the Society has a small volunteer panel of experts prepared to help individual members with advice. In both cases members should initially address their enquiries to the membership services officer at RSGB HQ.

COUNCIL ELECTION RESULT

The result of the ballot to fill two vacancies on Council from 1 January 1982 was as follows:

ORDINARY MEMBERS

Candidate	Votes
R. Bellerby, G3ZYE	2,734
A. H. Hammett, G3VWK	1,107
G. Knight, GM8FFX	1,721
T. I. Lundegard, G3GJW	1,936
F. Rose, G2DRT	1,131
Total number of ballot papers accepted	4,429
Number of ballot papers not accepted as a result of being late, spoilt, unidentified or duplicated	321

Messrs R. Bellerby, G3ZYE, and T. I. Lundegard, G3GJW, were accordingly elected to serve on Council for the three years 1982-84.

Interference leaflet

Members are reminded that a single-page leaflet on problems associated with interference to domestic entertainment equipment has been produced by the RSGB. It is intended for neighbours of radio amateurs, and is obtainable by sending a stamped addressed envelope marked "membership services officer" to RSGB HQ.

BARTG

At the annual general meeting of the British Amateur Radio Teleprinter Group on 7 November 1981, it was decided that in order to cover rising costs the subscription be increased to £4 on joining, with an annual renewal fee of £3.50. Applications for membership, and renewals, should be sent to: BARTG Membership Secretary, Mrs I. Double, 89 Linden Gardens, Enfield, Middlesex EN1 4DX.

Other correspondence should be addressed to the secretary of BARTG, Mr E. Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston upon Thames, Surrey.

Castle Donington prize winners

The prize winners in the ARRA free raffle held at their Castle Donington exhibition were: 1st, £200, B. Hercombe, G4JCH; 2nd, £100, E. J. Bailey, G8JVB; 3rd, £50, C. Houlston, G8YDF; 4th, £40, H. J. Paice, G4DCS; 5th, £25, T. Fletcher, G4EGB; 6th, £25, G. Eaton, G3SMK; 7th, £25, B. G. King, G8CHC; and 8th, £25, J. H. Mitchell, G4DMX.

Waters & Stanton Electronics also ran a free raffle at the exhibition, the winner being C. H. Thorpe, G3IZ.

Can you help?

Mr J. Macdonald, GM8BFG, plans to open an "Orkney Wireless Museum", during summer 1982, at which radio equipment used locally in the home, at sea, and by British Forces during the war will be exhibited. Included will be a typical amateur radio station, circa 1948, dedicated by the late Jack Twatt, GM3CCK, but unfortunately without any of his QSL cards, which were destroyed by flood. Any members who had QSOs with GM3CCK between 1948 and 1979 are asked to kindly send a duplicate card for display purposes to GM3CCK's daughter, Mrs Kim Gee, GM4LNN, QTHR.

Mr P. J. Sterry, G3CBU, QTHR, would like to get in touch with any member who has a copy of the pre-war (circa 1933-9) first edition of *A Guide to Amateur Radio* published by the RSGB. He has a copy which lacks a cover, and he wishes to see if he can restore it to something like its original form by having a sight of one.

An airworthy Lancaster in the RAF's Historic Flight which is having its interior restored has already been fitted with a working 1154/55, but the RAF is anxious to acquire a Gee or H25 indicator or any of the wartime equipment such as Monica or early vhf sets which were fitted in Lancasters and Halifaxes. Any member who might have items of such equipment or other wartime airborne electronic equipment (it does not need to be in working order) to aid in the restoration is invited to contact Warrant Officer Pete Rushen, 5 Cliffe Avenue, Ruskington, Sleaford, Lincs.

Mr T. H. Gibson, G4LQC/5N8THG (ex 5Z4IP, 5H3IP, MP4TAY, 4S7TG, VS2EQ) is attempting to regenerate interest in amateur radio in Mozambique (C9) and, hopefully, to obtain authority to reintroduce licensed activity there. For this purpose he needs any amateur radio magazines, no matter how old, and simple constructional articles suitable for novices. Anyone who can help is asked to write to him at: IAL, Beira Int Airport, CP336, Beira, Mozambique.

Dr J. R. L. Walker, ZL3IB, is trying to restore an elderly Q-Max receiver Type Q5/10X, and would be grateful for a copy of the circuit and/or service data. Expenses involved will be refunded (cash or NZ stamps). His address is 19 Athol Terrace, Christchurch 4, New Zealand.

Stolen equipment

On 5 October from a car in West Gorton, Manchester: Icom IC260E, serial number 10501282, and scanning microphone. Information to A. P. Ashcombe, G4APA, tel 09363 6412.

On 9 October from a car in Preston, Lancs: Icom IC240, serial number 03453, and ptt microphone. Fitted with miniature toggle switch for toneburst on rear right-hand bottom panel. Information to J. R. Cunliffe, G3ZOC, QTHR.

From a Mini pick-up in Grays, Essex: Icom IC240, with flying-lead connector at rear and channels wired for S16–23, 144·800MHz and R0–9. Information to S. Young, G8VAU, QTHR, or Grays police.

From a vehicle: Yaesu FT280 144MHz multimode, serial number 01030042. Information to A. Wheeler, G8NRI, QTHR, or Carlisle Street police station, tel 01-703 0844.

From a car in London E17: Sommerkamp FT480R Mk1 144MHz multimode, serial number 02060959. Information to T. J. Bartels, G8XFP, tel 01-527 3912 or Chingford police.

On 8 November from a house in Horley, Surrey: Yaesu FT101E, serial number 71893339; pair YH55 headphones; 7048 stand microphone, and twin-meter swr bridge. Information to H. W. Merry, G3RRR, QTHR.

UOSAT Technical Handbook

The first printing of this handbook, advertised in *Rad Com* October 1981, p905, was quickly sold out, and a reprint is now available at a cost of £1.23 incl p&p. Also now available is a set of 26 up-date sheets for the first printing at a cost of £1.23 incl p&p.

Both the handbook and the up-dates are available from the secretary of AMSAT-UK, Mr R. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ.

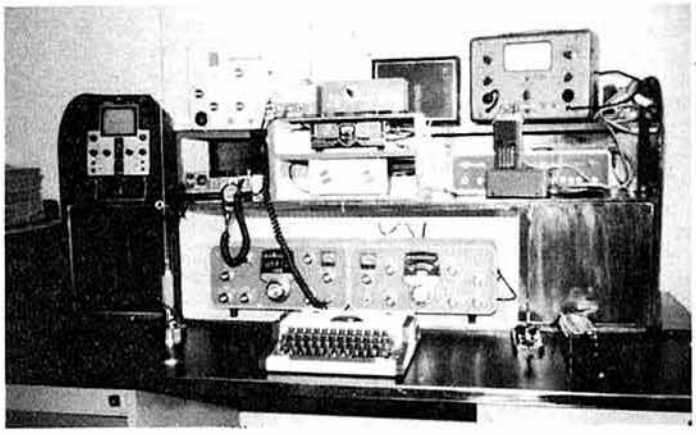
Looking ahead

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

9 January—RSGB Presidential Installation, Derby.
20 March—RSGB VHF Convention, Sandown Park.
4 April—Northern Amateur Radio Societies Association Exhibition, Lancaster Suite, Belle Vue Leisure Park, Manchester.
19 June—HF Convention, Belfry Hotel, Oxford.

6th EI/GI Convention
Ballymascanlon, 10–11 October 1981

This event, which attracted over 300 amateurs from both sides of the border, included talks on "Satellite working" by Ron Broadbent, G3AAJ, and "HF propagation" by Con Hunter, EI9V. At the informal dinner on the Saturday, presentations were made to the presidents of both national societies and their xyls. The photographs show the presidents and the organizing committee and guests.



The rig used by disabled member Norman G. Thomas, G6ELB, who hopes to start a club for disabled and blind people who are interested in sitting the RAE. He is prepared to coach them up to and beyond the standard required to pass, including practical work. Anyone interested in this idea should write to G6ELB at 20 Thomas Baines Road, Winstanley Estate, Battersea, London SW11 2HW; tel 01-228 1327

Jimmy Upton, EI8Z, IRTS (left) and Basil O'Brien, G2AMV, RSGB, compare the presidential chains of their respective societies

Left to right: (standing) Ian Kyle, GI8AYZ, RSGB Zone F manager; Terry Barnes, GI3USS, RSGB Region 15 representative; Willie Scully, EI2I, treasurer; Basil O'Brien, G2AMV; Jimmy Upton, EI8Z; Barney Patterson, GI3KYP, chairman; and Sean Nolan, EI7CD, vice-chairman; (in front) Ron Broadbent, G3AAJ, and Con Hunter, EI9V

Some additions to the GB3US basic repeater logic

by A. J. T. WHITAKER, G3RKL*

Introduction

Since publication of the original article [1], there are now many GB3US logics in use throughout the UK and Eire. However, several groups have expressed the desirability of adding a talkthrough time limit (timeout)—indeed some have already done so—and this article describes a suitable circuit which can be added with little or no modification to the existing board†. Also described is an option to have the low deviation callsign sent on access, and a simple 1,750Hz self-tuning notch filter, as used on GB3HH, to replace the tone gate. This notch could, of course, be added to any other control system where it is required to reduce the volume of relayed tone-bursts, and the pcb has been designed to make the omission of the timeout circuitry very easy. It should be noted that in Fig 2 (c) of the original article, pin 15 of IC8 should be shown connected to pin 15 of IC9.

Low deviation callsign on access

Fig 1 shows the modification to Fig 2(b) of the original article, to give the low deviation callsign on each access, ie from cold. On access, RELAY goes to a logical one, and when link FD is in place, C25, R40 produce a short pulse, which is applied to the reset line of the CALLSIGN INTERVAL TIMER IC12 via IC2c, so starting the callsign. D8 prevents this pulse from being shorted out by IC10, should link DE be in place for the optional callsign at the end of PIP TONE.

Talkthrough time limit

The timing element is an NE555, which is reset and triggered via IC4a either by TONE DETECT "anded" with $\overline{\text{RELAY}}$ on access, or by FIRST PIP during relay (Fig 2). This reset and trigger pulse is also "anded" via D4 and D5 with the inverted output of the NE555 (IC5) so that the one-shot consisting of IC4c, d and C14, R19, is triggered only when IC5 "timesout" naturally. This one-shot pulse is routed via D6 to the RELAY flip-flop on the original circuit, switching it out of relay mode, and also through D7 to the CALLSIGN flip-flop, should the option of the high deviation callsign on timeout be required. This does, however, require a slight modification to the original circuit by the inclusion of a 1MΩ resistor, R28, as shown in Figs 3(a), (b), although even this can be avoided by taking the output of D7 to Veropin D instead of IC3b/6. Linking M-N enables the timeout option, and with the values of R17, C13 and RV4 given, a talkthrough time range of approximately 3 to 9min is available (GB3US was set to 4min).

1,750Hz self-tuning notch filter

This is an extension of the fixed 1,750Hz notch used in all the GB3HH Mk2 logics, and a slight modification to the self-tuning version described in [2].

*Department of Electronic and Electrical Engineering, University of Sheffield, Mappin Street, Sheffield S1 3JD.

†Timeout is optional on UK repeaters, but where it is used the recommended periods are 5min on uhf and 2min on vhf repeaters.

Components list

R1, 12	100kΩ	C1	0·47μF	250V, min polyester
R2, 8, 10, 16, 17, 18, 19, 20	470kΩ	C2, 3, 12, 14, 25†	0·01μF	
		C4, 7, 8	0·1μF	
R3	68Ω			
R4, 5	6·8kΩ	C5, 6	1,000pF	160V, polystyrene
R6	47kΩ			
R7, 9	33kΩ	C9, 10, 11	10μF	25V, tube
R11, 13*, 14*	4·7kΩ			
R15	22kΩ	C13	220μF	16V, pc
R28†	1MΩ			
RV1	220Ω	D1-7, D8†	1N4148	
RV2	10kΩ	TR1	2N3819	
RV3	22kΩ	IC1	348 (Quad 741)	
RV4	1MΩ	IC2	CD4011BE	
Resistors 0·25/0·33W, 5%, high stability carbon film.		IC3	CD4013BE	
		IC4	CD4001BE	
*See text.		IC5	NE555V	
RV1-4 min horizontal preset		SK1	10-way pc connector (RS 488-359)	

†R28, C25 and D8 are additional components on the original pcb.

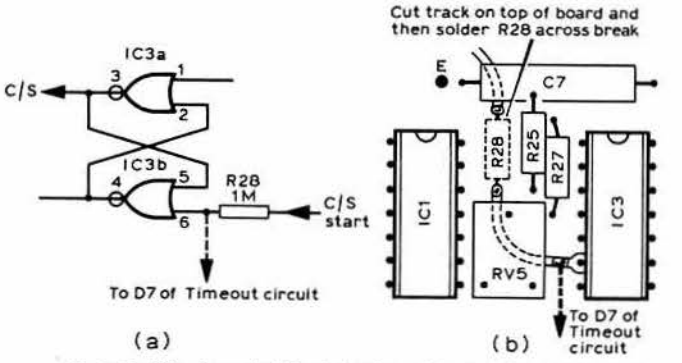


Fig 3. Modification of original circuit to allow callsign on timeout

The fixed filter consists of IC1a, b and associated components (Fig 4), and is tuned by RV1. At resonance there is a 180° phase change at the output of IC1a, compared to the input, and it is this property which is used for tuning. The two signals, input and output from IC1a, are limited and converted to cmos levels by IC1c, IC2a and IC1d, IC2b respectively, before being applied to the phase detector IC2c and IC3. The error voltage is filtered by C7, 8 and R8-11, and is then used to control the resistance of the fet TR1 so that the filter is kept in tune. The capture and tracking range is determined by R3, and the value shown, 68Ω, will give approximately ±50Hz.

Construction and alignment

Fig 5 shows the single-sided pcb layout, and Fig 6 the corresponding component positions. Should only the filter be required, the timeout circuitry can be discarded, the leads to SK1 omitted, and the ground connection along the bottom edge extended to meet the side. The operational amplifiers require a centre rail (Vs/2) which would normally be supplied from the original GB3US board, but R13 and R14 can be inserted if only a single supply is available.

Construction is perfectly straightforward, providing due care is taken

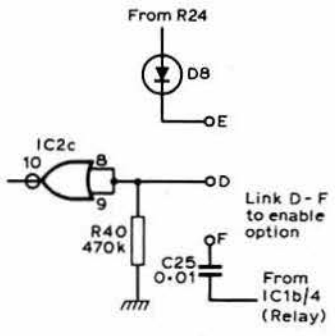


Fig 1. Optional callsign on access

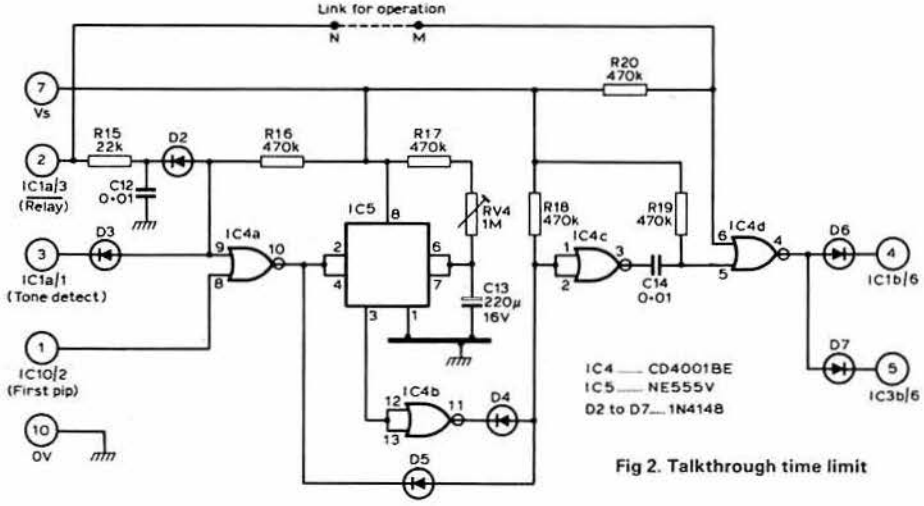


Fig 2. Talkthrough time limit

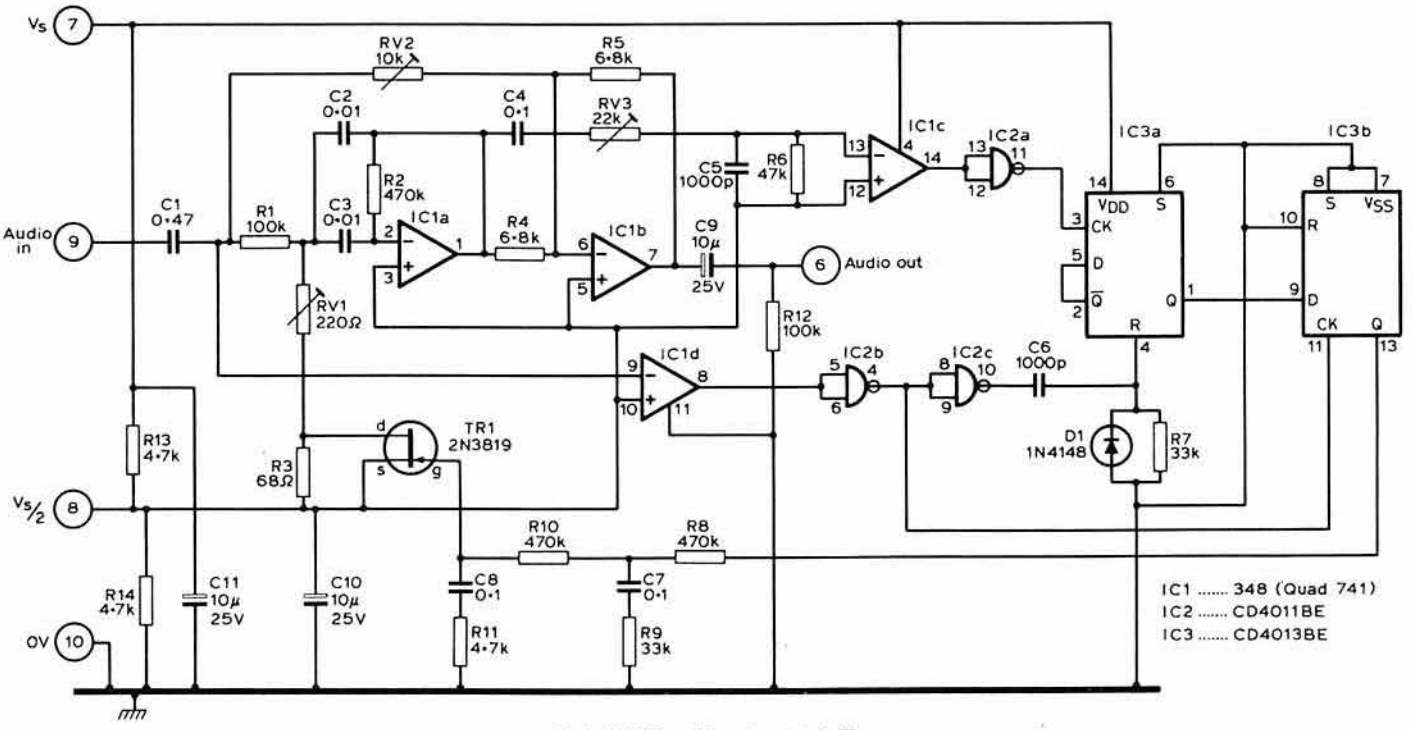


Fig 4. 1,750Hz self-tuning notch filter

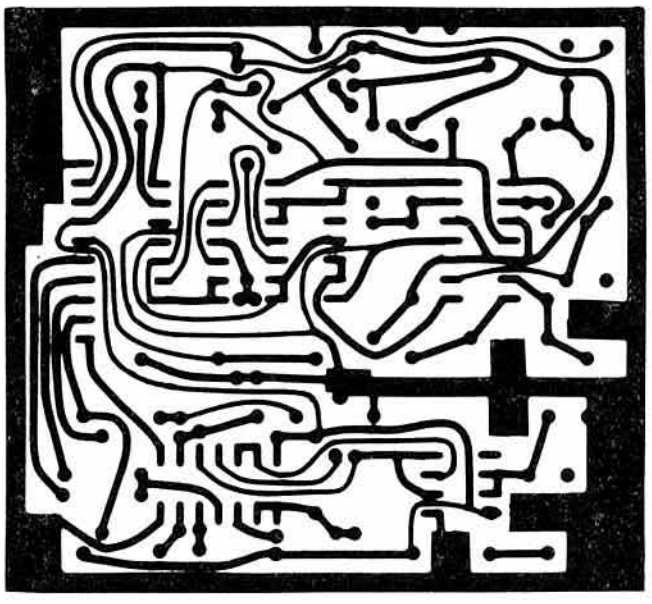


Fig 5. The printed circuit board

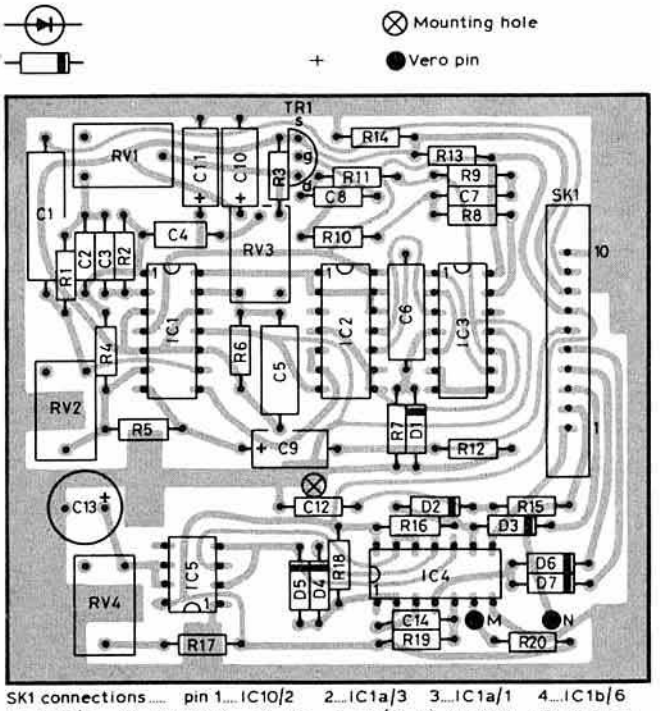


Fig 6. PCB component layout

when handling the cmos devices, which should be put in last. The hole near C12 allows mounting the board on a plastic pillar over the callsign diode matrix on the original board; the corresponding hole being drilled in the letter "S" of the GB3US logo. Electrically, the filter should be inserted into the audio path in place of the original C1, and the tone gate defeated by turning RV8 fully counter-clockwise. After all the interconnections have been made, the timeout should be set to the required talkthrough period with RV4, and enabled by linking MN.

To align the filter, set RV1, 2 and 3 to half way, inject a 1,750Hz tone into the logic input at a level corresponding to a 5kHz deviated signal from the receiver, and observe the audio output to the transmitter with an oscilloscope. Tuning RV1 should give a small range over which this output is reduced; set RV1 to the centre of this range. Now adjust RV2 and RV3 alternately to give the best null, which should be well in excess of 20dB. Check the capture and tracking range by swinging the input about 1,750Hz, if necessary altering RV1 and R3 to make it symmetrical and of the desired magnitude respectively. Finally, adjust RV1 on the original board to compensate for any level change through the filter.

Conclusion

These simple additions extend the options on the GB3US logic, and so enhance its flexibility and tailoring capabilities to a group's particular requirements. The self-tuning 1,750Hz notch filter cuts those loud tone-bursts down to size, without affecting the rest of the audio, and can be built as a separate unit for use with any other control.

References

[1] "A basic repeater logic system (The GB3US Mk1)", A. J. T. Whitaker. *Rad Com* January 1980, pp34–40.

[2] *RSGB Repeater Report* October 1979, No 3.

An audio swr meter

by R. BOWDEN, G4JOU*, and
A. WATSON, TECH (CEI), AMSERT, G4DZS

THE SWR METER described in this article was designed primarily for the blind amateur, and therefore has a minimum of operator controls. The unit produces an audio tone whose frequency falls as the swr approaches unity. For a given swr the tone will remain constant regardless of transmitter power.

Operation

The sense head (Fig 1) produces voltage outputs which are proportional to the forward and reflected powers. About 6V is available in the forward direction for 100W of rf. The circuit is a standard design and is taken from the *Radio Communication Handbook* Vol 2. Any circuit giving sufficient output may be used, or an output can be taken from an existing swr meter.

The ratio of the forward and reverse voltages gives the reflection coefficient P:

$$P = \frac{V_{reverse}}{V_{forward}}$$

Conventional swr meters measure P (which varies in value from 0 to 1) but are calibrated in swr as

$$SWR = \frac{1 + P}{1 - P}$$

To achieve the division of $V_{reverse}$ by $V_{forward}$ the two voltages are fed to logarithmic amplifiers IC1a and IC1b (Fig 2). These amplifiers have an output voltage of the form:

$$V_{OUT} = A\log KV_{IN}$$

*69 Miltons Crescent, Godalming, Surrey GU7 2NT.

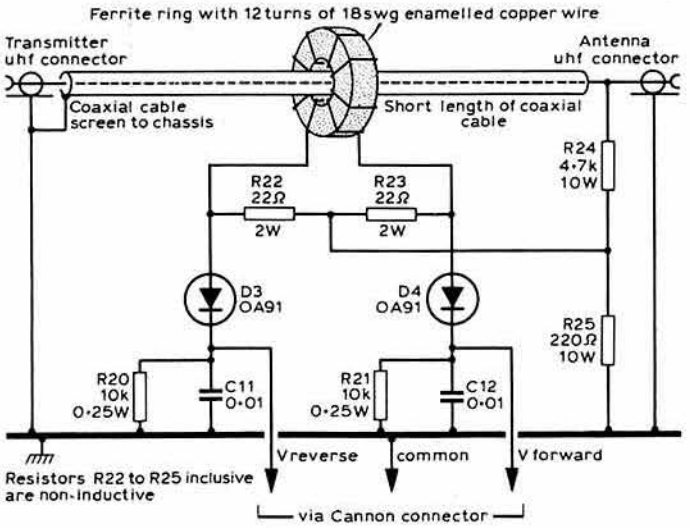


Fig 1. Sensing head

The stage gain of a normal inverting operational amplifier is given by

$$A_V = \frac{V_{OUT}}{V_{IN}} = \frac{R_F}{R_{IN}} \qquad \text{(See Fig 3)}$$

If R_F is made to vary according to a logarithmic law, then, as A_V is directly related to R_F, A_V must follow a logarithmic law. The logarithmic feedback characteristic is produced by substituting a transistor for the purely resistive element R_F as shown in Fig 4. The diodes D1 and D2 are included to prevent excessive reverse bias being applied to TR1 and TR2. The outputs from these two amplifiers are subtracted by IC1c, which operates as a unity gain differential amplifier (Fig 5).

$$\begin{aligned} V_{OUT} &= V_1 - V_2 \\ \text{hence as } V_1 &= \log V_{reverse'} \\ V_2 &= \log V_{forward'} \\ \text{then } V_{OUT} &= (\log V_{reverse'} - \log V_{forward'}) \\ &= \log \left(\frac{V_{reverse'}}{V_{forward'}}\right) \\ &= \log P \end{aligned}$$

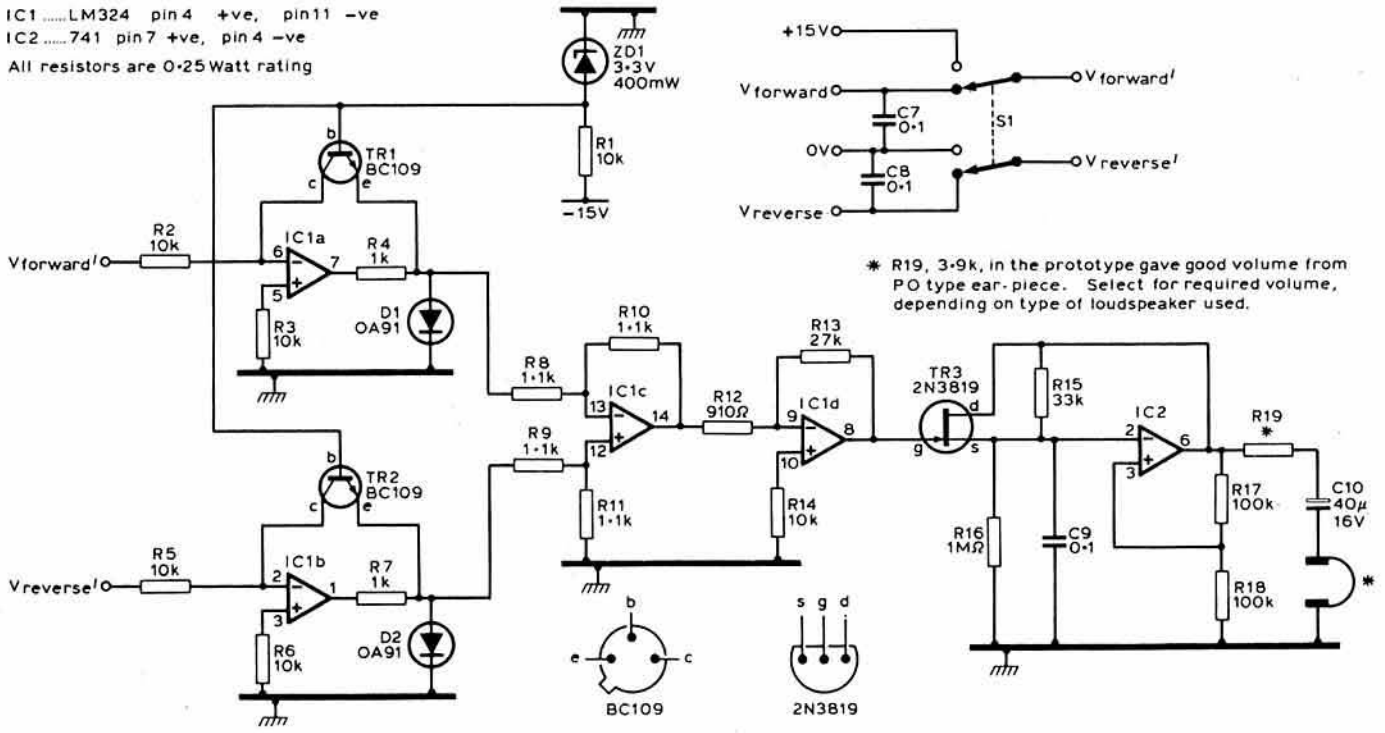


Fig 2. Processing and vco unit

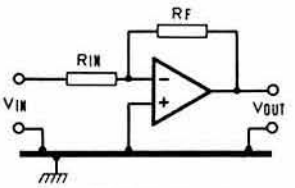


Fig 3. Op-amp as non-inverting amplifier

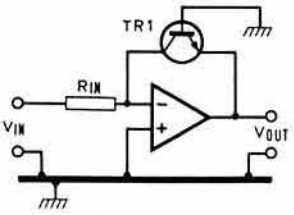


Fig 4. Op-amp as logarithmic amplifier

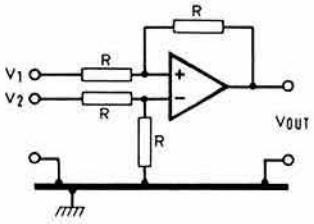


Fig 5. Op-amp as unity gain differential amplifier

The output of IC1c is therefore proportional to the log of P, the signal is left in logarithmic form as this gives expansion of the scale as swr approaches unity (Fig 6).

IC1d inverts and amplifies the output of IC1c to drive the vco control element TR3. The voltage applied to TR3, and hence its resistance, increases as swr falls. As TR3 resistance increases then the tone of the relaxation oscillator IC2 falls, the lowest tone indicating best swr.

The relaxation oscillator uses the op-amp as a comparator, ie the output of IC2 will be ±15V. When the output is +15V, due to R17 and R18 the non-inverting input will be at +7·5V, and C1 will be charging up via R15 and TR3. When the voltage on the inverting input exceeds +7·5V the output will change to −15V. The non-inverting input will now change to −7·5V, and C1 will now alter its charge until the inverting input will be more negative than −7·5V, at which point the output will again revert to +15V and the cycle will repeat. The rate at which the op-amp output switches between ±15V is determined by TR3, R15 and C1.

S1 is provided to simulate unity swr and provide a reference tone.

The power supply (Fig 7) is a conventional arrangement producing ±15V from a regulator IC.

Construction

Sense unit

The sense unit was built in a small aluminium box with the output taken via a double-core screened lead to the processing unit. Resistors R22 to R25 inclusive should be non-inductive, and R22/R23 should be matched. The ferrite ring is non-critical but should be capable of operating at up to 30MHz.

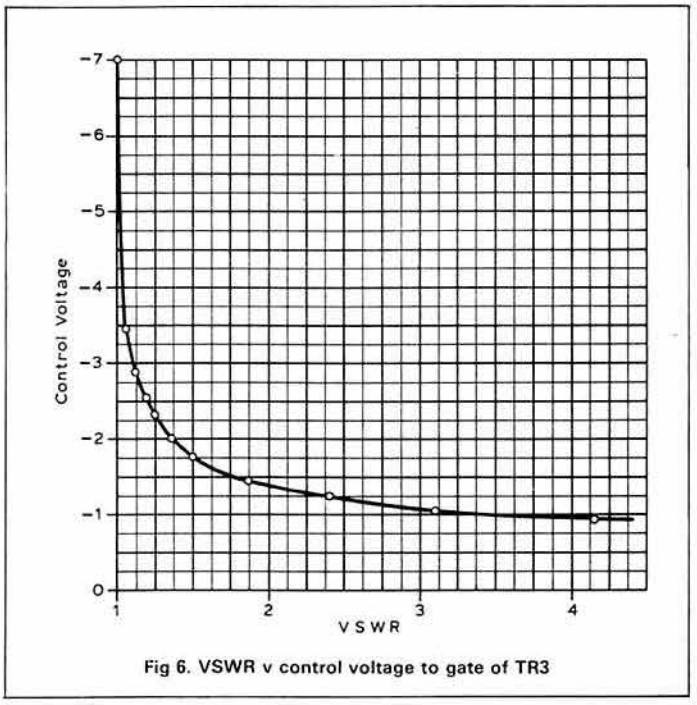


Fig 6. VSWR v control voltage to gate of TR3

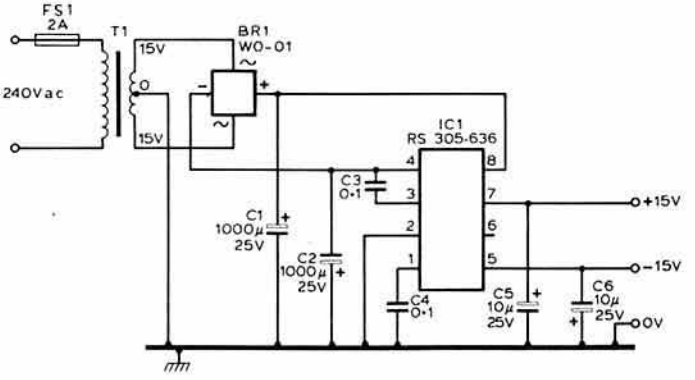


Fig 7. PSU used in prototype

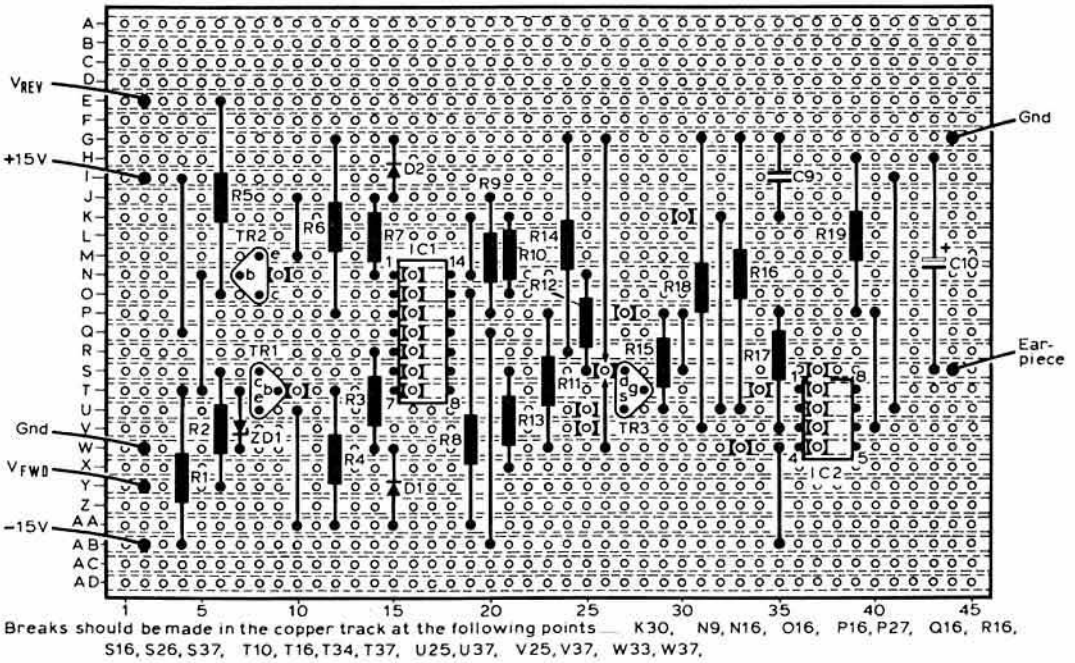


Fig 8. Veroboard layout of processing and vco unit

Breaks should be made in the copper track at the following points — K30, N9, N16, O16, P16, P27, Q16, R16, S16, S26, S37, T10, T16, T34, T37, U25, U37, V25, V37, W33, W37.

Components list

R1, 2, 3, 5, 6, 14, 20, 21	10kΩ 0·25W	C1, 2	1,000μF 25V
R4, 7	1kΩ 0·25W	C3, 4, 7, 8, 9	0·1μF
R8, 9, 10, 11	1·1kΩ 0·25W	C5, 6	10μF 25V
R12	910Ω 0·25W	C10	40μF 16V
R13	27kΩ 0·25W	C11, 12	0·01μF
R15	33kΩ 0·25W	TR1, 2	BC109
R16	1MΩ 0·25W	TR3	2N3819
R17, 18	100kΩ 0·25W		
R19	3·9kΩ 0·25W	IC1	LM324
R22, 23	22Ω 2W*	IC2	LM741C 8-pin dil
R24	4·7kΩ 10W*	IC3	RS 305-636
R25	220Ω 10W*		

*Non-inductive

D1, 2, 3, 4	OA91 (or similar)
ZD1	3·3V 400mW
BR1	W0-01 1A 100V piv (or similar)
S1	DP changeover, push, non-latching
T1	15-0-15 250mA
Fuse	2A
Veroboard	3 by 4·5in, 0·1in matrix copper tracked
Ferrite ring	(See text)

Processing and vco unit

This was constructed on Veroboard (Fig 8) and, together with the psu, enclosed in a second aluminium box. Screening and decoupling is important, as rf intrusion will affect the vco.

Conclusion

Tests have been conducted with the authors' own stations, and it has been possible to tune for minimum swr over a wide range of rf powers. The sense head described requires a minimum of 5W for satisfactory operation.

If a visual readout is required, a 10V fsd meter with an internal resistance of ⩾20kΩ may be connected between IC1d pin 8 (−ve) and earth (+ve). A peak reading as shown in Fig 6 indicates minimum swr.

Acknowledgement

The authors would like to thank the Independent Broadcasting Authority for use of facilities and equipment at the Croydon Regional Operations Centre. □

A simple method of microwave frequency measurement

by JOHN WILSON, G8KIS*

WITH THE READY AVAILABILITY of doppler modules intended for use as intruder alarms and radar speed detectors, more and more amateurs are beginning to experiment with microwaves. Although these modules offer the nearest thing to a "no plumbing" rig, they do nevertheless present one problem, namely retuning to operate within the nearest amateur band.

At this point, having studied some excellent wavemeter designs in such publications as the *VHF/UHF Manual*, the would-be microwave experimenter in all probability gives up and reverts to 432MHz or lower. The reason is that, if ready-made doppler units avoid the need for plumbing, the same is definitely not true of accurate wavemeters.

Fortunately the very design of doppler modules, coupled with the properties of microwaves themselves, leads to a very simple method of getting equipment at least roughly on the desired frequency.

Fig 1 shows the general layout of a typical unit, together with the sort of 10-15dB gain horn antenna that is often supplied to match. (Other types of doppler module have the Gunn diode and the mixer diode in separate pieces of waveguide mounted back-to-back; the operating principle is, however, identical.)

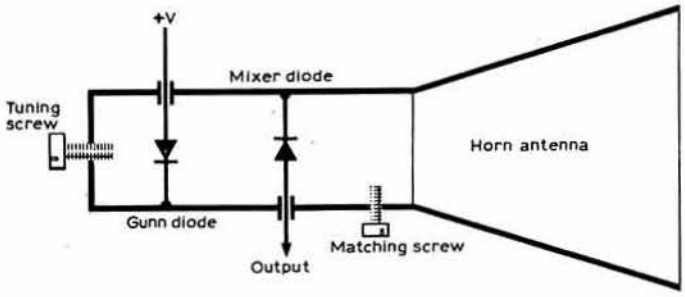


Fig 1. Schematic diagram of a typical doppler modulator

*25 Quarrendon Road, Amersham, Bucks HP7 9EF.

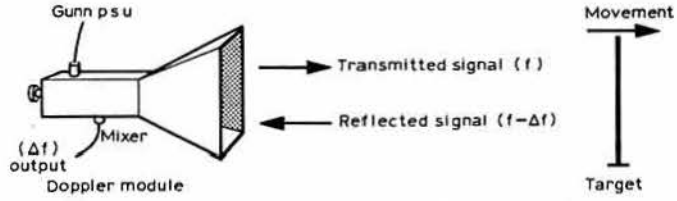


Fig 2. Use of doppler module to detect movement

Detecting movement

In normal use the microwave energy generated by the Gunn diode serves two functions: the first of these is to transmit a beam at the target, and the second is to act as a local oscillator. If the target (such as your car!) is moving, then it will reflect the beam back to the unit with a frequency shift corresponding to the speed and direction of motion. The diode serves to mix this returned frequency with the generated frequency and produce an audio output accordingly (Fig 2).

For amateur transmission purposes the external circuitry is somewhat different, and several good arrangements have been published from time to time in *Rad Com.* To begin with, the Gunn diode will be modulated with audio frequencies to enable voice transmission to take place. Similarly the mixer diode, instead of producing a dc output directly, will drive a conventional i.f. strip operating anywhere between 10·7 and 100MHz. Almost certainly there will also be a meter to monitor the mixer diode current, this being the only essential ingredient of the following method of measuring frequency.

Reverting to Fig 2, it is easy to deduce that the mixer diode output, when used as a doppler radar, is dependent not only on the target speed but also on the transmission frequency. Assume for a moment that the target is an integral number of half-wavelengths from the unit. Under these conditions the reflected signal will be in phase with the generator, and the mixer current will be a maximum. If the target is then moved $\lambda/4$ further away, the total signal path will be $\lambda/2$ longer, with the result that the reflected signal is out of phase. The mixer current will now be at a minimum. If the mixer current is monitored while a target slowly recedes or approaches, it will be seen to rise and fall once for every $\lambda/2$ the target moves. (This means, other things being equal, that the higher the Gunn frequency the more sensitive the unit is for speed or distance measurement purposes.)

Frequency measurement

For amateur frequency measurement, this principle can be directly applied at the kitchen table level. For a typical doppler module, enough signal is reflected from an ordinary metal tea tray 10ft away to be readable on a mixer current meter. Apart from the tea tray, all that is then needed is a metal tape measure and some adhesive tape. The general arrangement can be seen in Fig 3.

First, make a scribed mark at some convenient point on the doppler module (or its casing) adjacent to the metal rule. Then stand the tea tray on its end about 2ft in front of the module, though the precise angle and distance do not matter as long as the tray does not move relative to the rule. Next, move the doppler unit backwards or forwards until the meter shows

a maximum. (Such maxima will occur every 1·5cm for a 10GHz rig). Choose one such maximum and note carefully the measurement on the rule corresponding to the scribed mark on the equipment.

If the module is then slowly moved away from the tray, the mixer current will fall and rise in successive cycles. In theory one could measure the distance moved in just one cycle, but the accuracy would be too low for practical purposes. It is therefore best to measure the distance over which the mixer current has gone through 20 or more cycles. (How many depends entirely on the length of the kitchen table and the strength of the reflected signal. When the distance is too great the meter movements are too small to read accurately.)

To calculate the frequency, remember that any movement of the module must be doubled to get the change of path length. The relationship is as follows:

$$\text{Frequency} = \frac{\text{Velocity of EMR in free space} \times \text{No of measured cycles}}{2 \times \text{measured distance}}$$

Simplifying and putting in practical units, this becomes:

$$\text{Frequency (GHz)} = \frac{14{\cdot}99 \times N}{\Delta D}$$

where N = number of cycles and ΔD = measured distance

To take a practical example: suppose that 40 cycles were measured over a distance of 59cm. Inserting the data into the equation:

$$F = \frac{14{\cdot}99 \times 40}{59} = 10{\cdot}16\text{GHz}$$

The accuracy of this method is determined largely by the accuracy of measurement. In the above example assume that the 59cm were measured to an accuracy of 1mm; not too difficult in practice. The accuracy would then be approximately one part in 600, ie within 17MHz at 10GHz.

One other possible source of inaccuracy is the effect on the Gunn oscillator stability of too much signal being reflected back into the horn. For this reason the tea tray should be kept at least 1ft from the module, and preferably more. It should also be borne in mind that if the module is fitted to any other antenna or waveguide system, the change of loading could also alter the frequency. Nevertheless, for getting a simple microwave rig roughly on frequency and safely within the allocated band, there can scarcely be a simpler method.

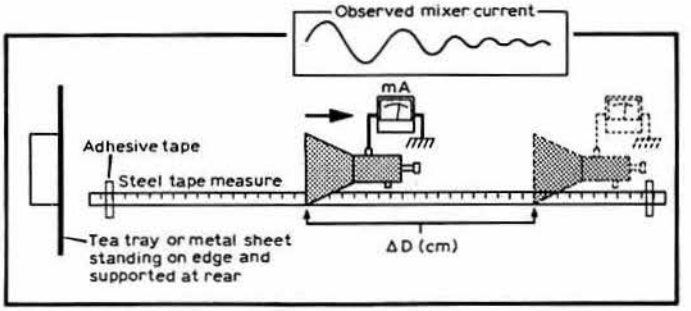


Fig 3. Simple table-top frequency measurement

Warning

Although the level of microwave radiation from equipment of this nature is extremely low, there are circumstances in which particularly sensitive parts of the body can be exposed to excessive amounts. The eyes are especially vulnerable in this respect, and experimenters are warned NOT TO LOOK DOWN THE END OF A WAVEGUIDE with the equipment switched on.

Acknowledgement

The author gratefully acknowledges the assistance of Richard Lambley, G8LAM, in the preparation of this article. □

NEW DESIGNATION OF EMISSIONS

The 1979 World Administrative Radio Conference changed the designation of emissions with effect from 1 January 1982 to allow for recent developments in radio transmission, including digital transmissions. The new code is in two parts, the first specifying the necessary bandwidth and the second the classification of emission.

The necessary bandwidth is specified as follows: between 0·001 and 999Hz in hertz (H); between 1·00 and 999kHz in kilohertz (K); between 1·00 and 999MHz in megahertz (M); between 1·00 and 999GHz in gigahertz (G). For example, 400Hz would be written as "400H", 2·4kHz as "2K40", and 12·5kHz as "12K5".

The classification is specified by three symbols. The first denotes the type of modulation of the main carrier, the second the nature of the modulating signal(s), and the third the nature of the signal to be transmitted. The following gives some examples of pre-1982 classifications and their equivalents in the new system:

Old	New	Old	New
A1	A1A	F2	F2A
A2	A2A	F3	F3E
A3	A3E		
A3J	J3E		

Classification of emissions

FIRST SYMBOL
Type of modulation of main carrier

1. Emission of unmodulated carrier: **N.**
2. Emission in which the main carrier is amplitude modulated, including cases where sub-carriers are angle modulated. Double sideband: **A.** Single sideband, full carrier: **H.** Single sideband, reduced or variable carrier: **R.** Single sideband, suppressed carrier: **J.** Independent sideband: **B.** Vestigial sideband: **C.**
3. Emission in which the main carrier is angle modulated. Frequency modulation: **F.** Phase modulation: **G.**
4. Emission in which the main carrier is amplitude or angle modulated either simultaneously or in a pre-arranged sequence: **D.**
5. Emission of pulses. Unmodulated sequence of pulses: **P.** A sequence of pulses (a) modulated in amplitude: **K,** (b) modulated in width/duration: **L,** (c) modulated in position/phase: **M,** (d) in which the carrier is angle modulated during the period of the pulse: **Q,** (e) which is a combination of the foregoing or is produced by other means: **V.**
6. Cases not covered above, in which an emission consists of the main carrier modulated, either simultaneously or in a pre-established sequence, in a combination of two or more of the following modes—amplitude, angle, pulse: **W.**
7. Cases not otherwise covered: **X.**

Note: Emissions where the main carrier is directly modulated by a signal which has been coded into quantized form (eg pulse code modulation) should be designated under 2 or 3.

SECOND SYMBOL
Nature of signal(s) modulating main carrier

1. No modulating signal: **0.**
2. A single channel containing quantized or digital information without the use of a modulating subcarrier (excluding time-division multiplex): **1.**
3. A single channel containing quantized or digital information with the use of a modulating subcarrier (excluding time-division multiplex): **2.**
4. A single channel containing analogue information: **3.**
5. Two or more channels containing quantized or digital information: **7.**
6. Two or more channels containing analogue information: **8.**
7. Composite system with one or more channels containing quantized or digital information, together with one or more channels containing analogue information: **9.**
8. Cases not otherwise covered: **X.**

THIRD SYMBOL
Type of information to be transmitted

1. No information transmitted: **N.**
2. Telegraphy—for aural reception: **A.**
3. Telegraphy—for automatic reception: **B.**
4. Facsimile: **C.**
5. Data transmission, telemetry, telecommand: **D.**
6. Telephony (including sound broadcasting): **E.**
7. Television (video): **F.**
8. Combination of the above: **W.**
9. Cases not otherwise covered: **X.**

Note: In this context the word "information" does not include information of a constant, unvarying nature such as provided by standard frequency emissions, continuous wave and pulse radars etc.

COMPUTERIZED LEARNING

The Sinclair ZX80 microcomputer as a morse tutor

by P. L. NEWMAN, G4INP*

Introduction

After purchasing the ZX80 (with 4k rom), the problem of what to do with it was greatly alleviated by the long evenings spent developing the program described in this article. A program was originally developed to transmit call-signs to a loudspeaker for station "idents" and to generate morse practice tapes. An "unintelligent" tutor followed and, after a very interesting correspondence with GU3MBS, this version was arrived at. The author believes the idea to be original on the ZX80, and gratefully acknowledges that the "speed" facility in this program is due to Steven Gibbs, GU3MBS.

Program description

Coding of morse characters

As an example, take the character Q: (ie --,-). Using the binary notation we may write this as 1101. Now, since we need a way of "sending" the coded information as it is decoded, we may reverse the string, to 1011. We shall see how this helps us later. The next step is to represent this string of binary as a decimal number, in this case 8 + 0 + 2 + 1, or 11. Since we need to know the end of a sequence, we can add a "mark" at the front, and "g" in our special form becomes "11011" or 27 (16 + 8 + 0 + 2 + 1).

Storage of coded characters

The coded characters are stored as "printable" characters in the REM line, since this is the most economical way of storing data in the limited space of the ZX80. Note that some of the values have had 112 added to make them printable, since otherwise they will either be "tokens" or non-printing.

Decoding the characters

Decoding of the characters is achieved by successive division by 2 (the longhand method of conversion to binary), until there is a remainder of 1, our marker. Thus Q will decode as follows:

27/2 = 13 remainder 1—so we send "dah"
13/2 = 6 remainder 1—so we send "dah"
6/2 = 3 remainder 0—so we send "dit"
3/2 = 1 remainder 1—so we send "dah"
and only one left so we stop sending.

Program details

The purpose of each line is described below.

Line 10. The 36 dots open up the ram space for the coded characters to be stored via a Poke statement. Sinclair Basic has no Data statement and this is a suitably space saving substitute.

Lines 11-14. This is the loop which Pokes the coded characters into ram, since the program always starts at address 16424 and the line number and REM token occupy three bytes.

Line 15. Returns the listing to screen after character entry is complete.

Line 19. Sets up the array A to hold the 10 randomly generated morse characters to be sent.

Lines 20-40. Locations 17300-17302 are used to hold a short machine code routine which creates the "noise". The numbers after the locations are the decimal equivalents of the following hex instructions: ED 51 C9 which in Z80 assembler is ld d,c and ret. ED is the subroutine entry point. The overall effect of this awesome piece of code is to cause the "synch" line to agitate at a high enough rate to give a fairly acceptable buzz.

Lines 50-60. The sending speed is requested and stored in "s". The speed is achieved by applying "s" to the computed length of the silence between letters or components of a letter.

Line 70. Resets the random number generator. This may be omitted but better results appear to be gained with it.

Lines 80-90. The screen is cleared and the speed written on the display.

Lines 100-120. The loop stores the randomly generated numbers between 28 and 63 into the array A. The ZX80 basic character codes of 0-9 and A-Z are 28 to 63 inclusive, so A holds these character values.

Line 130. Start of our loop in which characters are sent.

Line 140. Sets N to the value of the character in the byte pointed to by the current value in A. Since our coded characters are stored in the REM in the same order as the Basic character codes (0-9 and A-Z), we can "point" to byte 16399 (16427-28) and use our current value in A as the "offset". Thus if A had the value 28 we would point to byte 16427, which will hold our code for "0"

Line 150. Simply adjust N if we had to add 112 to it.

Line 160. Start of our sending sequence. This requires very careful explanation, and you may find Chapter 8 of your manual will help. A useful feature of ZX80 Basic is that expressions within an IF will be evaluated first and may be used as implied IFs within that line.

Consider this part of the line—(18-36*(N-(N/2)*2 = 1))—it actually evaluates N-(N/2)*2 = 1) first; thus if N = 60 (morse char, "3"), this expression will evaluate as follows: (60 - 30*2) will be 0 or false, which in ZX80 terms is 0, and hence the whole expression in brackets will evaluate to 18. If true, or in other words we do have a remainder, the evaluation is to 18-36*-1), or 54. This gives us the 3:1 dash:dot ratio.

This is a difficult point, but worth studying; remember that a "true" evaluates to -1 and "false" to 0 in ZX Basic. For further information see "Bits of Boole" *Computing Today* March 1981.

Line 170. This jumps to our noise making routine. This is done once for each dot or dash in a letter.

Line 180. End of current dot or dash.

Line 190. Performs division by two to get next binary number from coded character.

Lines 200-210. This loop performs in much the same way as the sending loop except that all it does is generate a silence either between characters or parts of characters. If N < 2 the silence will be longest since that is the end of a character. The speed S simply expands or contracts this time period, to give a fair representation of speed.

Line 220. If we have a remainder of > 1 then this sends execution back to complete the character.

Line 230. End of character sending loop.

Line 240. Prints a heading for checking input.

Line 250. Start of loop for checking 10 characters just sent.

Line 260. A character (hopefully just received!) is input.

Line 270. The character just sent is printed alongside the one input.

Line 280. End of character checking loop.

Line 290. Prints abbreviated instructions for altering mode etc.

Line 300. Input of control character.

Line 310. Returns list to screen if control character is X.

Line 320. Goes to line 50 to request new speed.

Line 330. Goes to line 80 to run program again.

Using the program

The program will transmit morse groups in a random fashion to the MIC socket of the ZX80, which may then be fed to a tape-recorder (with monitor facility) or to an amplifier. No hardware mods to the ZX80 are required and the program will fit in 1k of ram. A facility for checking the received groups, as well as controlling speed, is provided.

A listing of the complete program follows: enter it as given and SAVE it several times for safety. Note that this will not be how the finished program

*3 Red House Lane, Leiston, Suffolk IP16 4JZ.

will look; some lines will be deleted and the REM in line 10 will be Poked to provide Data for the finished program. Note the 36 dots in line 10—these are important—see below.

```
10 REM .....
11 FOR K = 16427 TO 16462
12 INPUT N
13 POKE K,N
14 NEXT K
15 LIST
19 DIM A(9)
20 POKE 17300, 237
30 POKE 17301, 81
40 POKE 17302, 201
50 PRINT "SPEED?"
60 INPUT S
70 RANDOMISE
80 CLS
90 PRINT "SPEED = ";S;" WPM"
100 FOR K = 0 TO 9
110 LET A(K) = RND(36) + 27
120 NEXT K
130 FOR K = 0 TO 9
140 LET N = PEEK(16399 + A(K))
150 IF N > 100 THEN LET N = N-112
160 FOR M = 1 TO (18-36*(N-(N/2)*2 = 1))
170 LET G = USR(17300)
180 NEXT M
190 LET N = N/2
200 FOR M = 1 TO (180-360*(N<2))/S
210 NEXT M
220 IF N > 1 THEN GO TO 160
230 NEXT K
240 PRINT "SENT RECVD"
250 FOR K = 0 TO 9
260 INPUT B$
270 PRINT CHR$(A(K)),B$
280 NEXT K
290 PRINT "N/L = MORE,X = STOP,S = ALTER WPM"
300 INPUT B$
310 IF B$ = "X" THEN LIST
320 IF B$ = "S" THEN GO TO 50
330 GO TO 80
```

Run the program, and in response to the input prompt at line 12, input the values from Table 1 in order.

Table 1

63 62 60 56 48 32 33 35 39 47
6 129 133 9 2 132 11 128 4 30
13 130 7 5 15 134 27 10 8 3
12 136 14 137 29 131

When input is finished the program will return to the screen with the REM statement modified to provide the data for the morse characters.

Next, delete line 11 to 15 inclusive. The program should now be in its finished form, so SAVE it several times prior to testing.

Testing

Connect an amplifier and speaker to the MIC socket of the ZX80, note the slight buzzing due to sync pulses. RUN the program, inputting a slow speed such as 3. The screen will "scramble" and morse characters should be heard from the speaker.

When asked for the answers, you need only hit NEWLINE for each character to be printed on the screen in the order that it was sent, or enter the character received and NEWLINE for a check.

Verify the response of NEWLINE, X or S after the answers have been displayed.

Notes on the program

(a) Lines 20–40 are a short machine code routine that produce the noise. Do not alter this (unless you have got a better version of course!).

(b) The array size in line 19 and the loop counters at lines 100, 130 and 250 could be increased to give more characters per run, *but* beware of this because you will almost certainly corrupt the machine code.

(c) The program sends morse characters in the range 0–9 and A–Z. □

A morse code practice program

by R. J. ECKERSLEY, G4FTJ*

A CONSIDERABLE AMOUNT of routine practice is necessary while learning to receive morse code, in order that the brain automatically associates the correct character with each pattern of dot and dash sounds. The use of a personal computer is particularly convenient for this task, for not only can it easily generate and send an inexhaustible supply of random morse code characters, but it can also display them later for checking purposes. This is important, especially in the early stages, in assessing progress and highlighting difficulties in receiving particular characters.

The computer program described below sends groups of five characters. The number of groups (up to a maximum of 20), the approximate number of words per minute (5–15) and the type of characters (letters, figures or both) are selectable by the user.

The overall speed is varied by adjusting the inter-character and inter-group spacing, and not the dot/dash times and spacing. This ensures that the student becomes acquainted from the start with the sound of morse sent at a character speed of about 12–15wpm, even though initially there are large spaces between characters.

*Flat G, 15 Gloucester Avenue, London NW1 7AU.

Program notes

The program (Listing 1) should be reasonably self-explanatory for readers with some Basic programming experience, and therefore no detailed description will be given. While it has been kept as "portable" as possible, a few notes may be of assistance to those using other Basics.

Lines 1070 and 1080 ask for a random number from the user to start a

Listing 1

```
10 REM MORSE CODE PRACTICE PROGRAM
1000 REM INITIALIZATION
1010 DIM C(21,6): DIM L$(37): DIM M(37,6)
1020 FOR I = 1 TO 36
1030 READ L$(I)
1040 FOR J = 1 TO 5
1050 READ M(I,J)
1060 NEXT J,I
1070 PRINT "Enter a random number (1-100)"
1080 INPUT A: Z = RND(-A)
2000 REM USER OPTIONS
2010 PRINT CHR$(12)
2020 INPUT "How many words per minute (5-15)"; W
2030 W = W*W
2040 INPUT "How many groups (max 20)"; G
2050 IF G > 20 THEN 2040
2060 PRINT
2070 PRINT "For letters only, type L"
2080 PRINT "For figures only, type F"
2090 PRINT "For both, type B"
2100 INPUT T$
3000 REM GENERATES THE RANDOM GROUPS
3010 PRINT CHR$(12); "GET READY. . .";
3020 FOR I = 1 TO G
3030 FOR J = 1 TO 5
3040 N = INT(36*RND(1) + 1)
3050 IF T$ = "L" AND N > 26 THEN 3040
3060 IF T$ = "F" AND N < 27 THEN 3040
3070 C(I,J) = N
3080 NEXT J,I
3090 FOR I = 0 TO 2000: NEXT I
3100 PRINT "GO"
4000 REM SENDS THE GROUPS IN MORSE CODE
4010 FOR I = 1 TO G
4020 FOR J = 1 TO 5
4030 N = C(I,J)
4040 FOR Y = 1 TO 5
4050 IF M(N,Y) = 0 THEN 4090
4060 IF M(N,Y) = 1 THEN CALL DOT
4070 IF M(N,Y) = 2 THEN CALL DASH
4080 FOR K = 0 TO 10: NEXT K
4090 NEXT Y
4100 FOR K = 0 TO 6000/W: U = 0: NEXT K
4110 NEXT J
4120 FOR K = 0 TO 15000/W: U = 0: NEXT K
4130 NEXT I
5000 REM PRINTS THE GROUPS
5010 FOR I = 0 TO 1000: NEXT I
5020 PRINT CHR$(12); "The groups were as follows:"
5030 PRINT
5040 FOR I = 1 TO G
5050 FOR J = 1 TO 4
5060 N = C(I,J)
5070 PRINT L$(N);
5080 NEXT J
5090 N = C(I,5)
5100 PRINT L$(N),
5110 NEXT I
6000 REM CONCLUSION
6010 PRINT: PRINT
6020 INPUT "More groups (Y/N)"; A$
6030 IF A$ = "Y" THEN 3000
6040 INPUT "Change required (Y/N)"; A$
6050 IF A$ = "Y" THEN 2000
6060 GOTO 8000
7000 REM CHARACTERS AND MORSE CODE
7010 DATA "A",1,2,0,0,0
7020 DATA "B",2,1,1,1,0
7030 DATA "C",2,1,2,1,0
      (etc)
8000 END
```

Listing 2

```
DOT:    LD B,30H        ;set dot time
        JR TN3
DASH:   LD B,90H        ;set dash time
TN3:    LD C,70H        ;set pitch
TN4:    LD A,20H        ;bit 5 high
        OUT (0),A       ;to port 0
        LD A,C
TN5:    DEC A           ;delay
        JR NZ TN5       ;until A is zero
        OUT (0),A       ;repeat with bit 5 low
        LD A,C
TN6:    DEC A
        JR NZ TN6
        DJNZ TN4        ;loop until done
        RET
```

different pseudo-random sequence each time. They could of course be replaced by 1070 RANDOMIZE if this function is available.

Line 2010 clears the vdu screen. Line 3040 selects a random number from 1 to 36 inclusive. Line 3090 gives a short delay before sending characters.

Lines 4060 and 4070 send a dot or dash respectively, using a short machine-code sub-routine to toggle a bit on one of the output ports at audio frequency. In the author's Nascom 1 system this is bit 5, port 0, which is connected via a single-transistor buffer amplifier to a small loudspeaker in the computer case. An example of a suitable Z80 routine is given in Listing 2.

Lines 4080, 4100 and 4120 determine the dot/dash spacing, the character spacing and the group spacing respectively, and will require adjustment with different systems, as may the use of W^2 as an empirical control. A suitable alternative to the latter should be easy to devise, if necessary, as complete accuracy is not essential.

Line 5010 gives a short delay before displaying the characters sent.

Conclusion

It must be emphasized that, while such a program is a useful aid to increasing speed immediately after learning the code, it is not final preparation for the plain-language part of the UK amateur morse test. It is relatively easy to concentrate on individual characters in random groups, but when the message has a meaning there is a great temptation to think about it while it is being received, and possibly to anticipate letters. This is detrimental to good copying, which should be "thoughtless" in a literal sense.

The student must therefore, if possible, still complete training on plain-language reception and, for those without cw experts at hand, the RSGB slow morse practice transmissions provide an excellent service. □

Sporadic-E observations in 1981

by R. A. HAM, BRS15744*

ALTHOUGH THERE WERE several sporadic-E events around 50MHz during April, the more widespread disturbances of the 1981 sporadic-E season did not begin until 3 May and ended 120 days later on 30 August —some 12 days longer than the 1980 season.

As in previous years the author used an R216 vhf communications receiver to listen for the television synchronizing pulses transmitted on Ch E2, 48·25MHz, and Ch R1, 49·75MHz, for advance warning of sporadic-E and, when this occurred, to tune between 40 and 80MHz, listening for broadcast dx. Regular observations over many years have proved that the 50MHz region is the most vulnerable to sporadic-E disturbances, and that the pulses from the variety of television transmitters on Ch R1 are among the first signals to be heard and the last to fade away when sporadic-E is present. This was very obvious towards the end of the season, when strong pictures were received from Eastern Europe on Ch R1 only and the disturbance continued on this narrow band until about 2000.

To monitor the television channels between 48 and 68MHz the author used a JVC 3060 625-line television receiver for monochrome, and a JVC CX-610GB and a Sanyo 9300PN video recorder for colour signals. Depending on the strength of the reflected signal, colour pictures were sometimes received on the European Chs E2, 3 and 4, Italian A and B and Russian R1 and 2.

During the 1981 season, sporadic-E reflections influenced the normal paths of radio signals between 40 and 80MHz on 39 days, compared with 52 days in 1980 and 48 days in 1979. As in previous years, the author's daily observations were made at approximately 0800, 1230 and 1800gmt, and the sporadic-E events recorded at those times are indicated by the dark squares in Fig 1 under times A, B and C respectively.

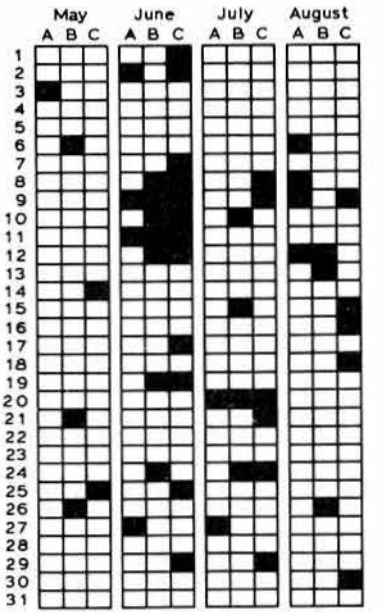


Fig 1. Monthly distribution of sporadic-E during the 1981 season

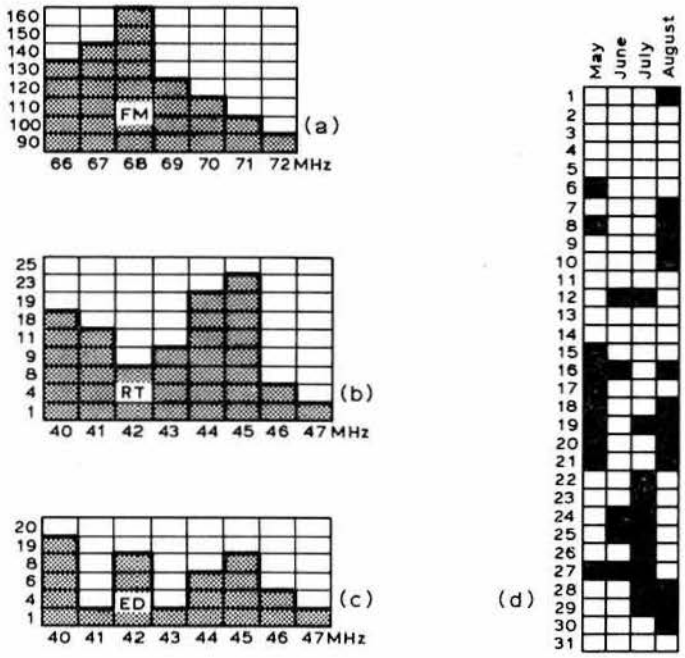


Fig 2. (a) East European fm stations heard in the UK. (b) European radiotelephone signals. (c) Electronic devices. (d) Solar noise recorded by the author on 143MHz.

Continental broadcasting stations

On every day, indicated in Fig 1, the sporadic-E disturbances extended up to 80MHz, with strong signals from up to 40 eastern European fm broadcasting stations being received in many parts of the UK. Fig 2(a) shows the radio frequency distribution and the number of times that the signals, between each megahertz, were heard by sporadic-E. As previously observed, one of the distinctive features of sporadic-E is the deep and sharp fading which usually occurs at the beginning, and shortly before the end of each event.

DX tv

Throughout the season a wide range of strong television pictures, sometimes in colour, were received by the author and fellow tv dxers from the countries listed in Fig 3. Very often pictures from several countries were fighting for predominance on the screen as the influence of the sporadic-E disturbance continually ebbed and flowed. Among the fascinating items seen were a large number of test cards in both mono and colour, a variety of the popular sports, news, adverts for many British goods, and such programmes as "The New Avengers", "The Streets of San Francisco", "Secret Army" and "Tinker, Tailor, Soldier, Spy", often with sub-titles.

*Faraday, Greyfriars, Storrington, Sussex RX20 4HE.

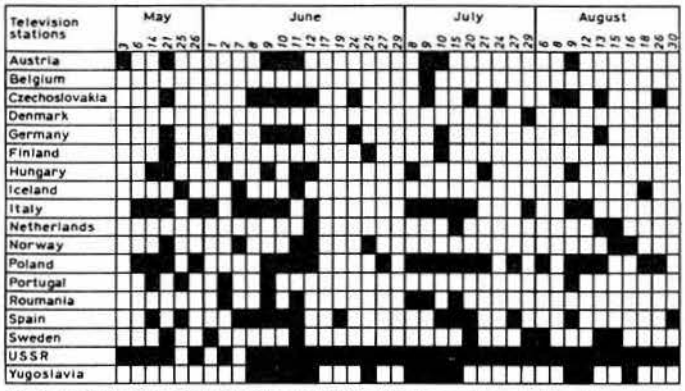


Fig 3. Distribution of tv pictures identified by the author and tv dxers during the sporadic-E season

European radiotelephone stations

Fig 2(b) shows the distribution of European radiotelephone signals heard by the author during the period, and that the total number received was 93, compared with 74 in 1980 and 99 in 1979.

Electronic devices

Fig 2(c) illustrates the radio frequency distribution of such signals as teleprinters, tones and various beacons which were heard between 40 and 47MHz from May to August, when a total of 47 such signals were received, compared with 73 in 1980.

Major events

Although many of the sporadic-E events during the 1980 season were below average intensity, a few events—especially those on 2, 7 and 9 June—extended into band 2, and into the 144MHz amateur band when amateurs in the UK worked stations in Czechoslovakia, Greece, Italy, Malta, Poland, Sicily and parts of the USSR.

28MHz band

Signals from the International Beacon Project stations in Germany, DL0IGI, 28,205kHz; and Norway, LA5TEN, 28,237·5kHz, were often very strong during the more extensive sporadic-E disturbances.

Solar activity

The author recorded 38 days of solar activity on 143MHz during the 1981 season, Fig 2(d), compared with 48 days for the same period in both 1980 and 1979. As previously stated, the author cannot see any direct connection between the "active" sun and sporadic-E disturbances. □

NEW PRODUCTS

Sabtronics LP1 logic probe

This new 10MHz logic probe from Sabtronics International of Tampa, Florida, is designed for trouble-shooting logic circuits. The LP1 has an l.e.d. display for logic 0 and 1, with switch-selectable thresholds to suit ttl or cmos/mos circuitry. The probe also has the useful ability either to detect and hold pulses or "glitches", or to stretch them.

The Sabtronics LP1

Power for the LP1 can usually be taken from the Vcc line of the unit under test with the aid of mini crocodile clips which are included. The power requirement is 5–15V, less than 30mA. The input impedance is 100kΩ and the maximum operating frequency 10MHz. Full interpretation instructions are printed on the reverse of the body of the LP1, which costs £24.95 plus VAT.

Further details from Black Star Ltd, 9A Crown Street, St Ives, Huntingdon, Cambs PE17 4EB; tel 0480 62440.

Ambit logic probe

This low-cost tri-state logic probe from Ambit International is specifically designed for trouble-shooting cmos, particularly "sample and hold systems" found associated with most modern frequency synthesizer phase detectors. The probe will specifically indicate basic logic conditions, high impedance (the "third" state), sine waves, and square waves with positive or negative offset.

The probe costs £9.99 plus VAT and is obtainable from Ambit International, 200 North Service Road, Brentwood, Essex CM14 4SG; tel 0277 230909.

The Ambit logic probe

LITERATURE RECEIVED

OK launch Electrowave

OK Machine & Tool (UK) Ltd have launched a new division, Electrowave, to provide the electronics user with what is thought to be the widest range of electronic hardware currently available in the UK. The big difference with Electrowave is that all of the products in the range—illustrated in a new 40-page catalogue—are available to everyone involved in building electronic equipment. This will include engineers, students, teaching staff, laboratory technicians and, not least, the hobby enthusiast. The catalogue contains various products selected from OK's bench tool range, plus some new items, and includes soldering irons, wire-wrapping kits, ic tools, pcbs, cases, enclosures, connectors, sockets and test instruments, to name just a few.

Electrowave is distributed throughout the UK by leading electronics and computer stores. Catalogues are free, but send 30p for postage and packing. Futher information from Mike Gouldsmith, OK Machine & Tool (UK) Ltd, Dutton Lane, Eastleigh, Hants SO5 4AA. Tel 0703 610944.

TECHNICAL TOPICS

Pat Hawker, G3VA

COMMENTING EACH MONTH on developments in the technology of amateur radio is a two-edged sword: there is always the danger of being either carried away with enthusiasm for some development that ultimately proves to be of little practical value; or, alternatively, of coming to believe that old ways were usually best ways. To walk a tightrope needs a sense of balance.

For example, in recent months I have suggested several times that for home-built transmitters, the valve is still much superior to the transistor; but this does not mean that I think that the whole semiconductor revolution has misfired. For many applications transistors and integrated circuit devices have brought tremendous improvements in performance, reliability and the reduction of volume, weight and power consumption. Colour television receivers, for example, now consume only about one-third of the power of the sets produced a decade ago and are vastly more reliable—to the extent where one manufacturer has been offering a five-year warranty on parts and labour. Amateurs may, of course, be a little jaundiced and point out that far less progress seems to have been made in designing the sets to be more resistant to rfi from strong local signals.

But as we go into 1982 it does seem that more and more people are coming to feel that technology change does not always mean progress, and are far more likely than previously to question whether scientific discoveries are likely to work out to their advantage. A recent American study, based on questioning 1,635 people, showed that over half of them felt that "scientific discoveries make our lives change too fast". They were particularly critical of advanced technology, though six out of seven still believe that the benefits of scientific research vastly outweigh the drawbacks; 81 per cent consider that science has made life healthier and easier. The survey also showed that interest in science and technology is far more widespread than the mass media appear to realize: 85 per cent said they were at least moderately interested in new discoveries; and 62 per cent claimed to keep themselves well informed about scientific developments.

Kiss it goodbye!

Cognoscenti of the "kiss" technique—keep it simple, stupid—may like to note two recent reports from the USA, although it is not only Americans who seem to like to make things as complicated as possible in the pursuit of "new technology".

A multimillion-dollar computer system has been removed from the USS Nassau, a 39,000-ton American naval assault ship, because of the expense of training sailors to operate it . . . the firm that supplied the system assumed that a certain level of technicians would be aboard. They were not! The original sophisticated controls will be removed from all five ships of this class at a cost of about $30m. A simpler system, compatible with established training programmes, will be fitted.

There is also a growing realization that as the cost and complexity of American weapon systems grow, the taxpayer is losing out on cost-effectiveness. Jeremy Taylor writing in *The Listener* states: warplanes such as the F-111, F-15 and F-14 are so sophisticated they keep breaking down: homing missiles do not work properly; advanced tanks have such severe teething problems that they are virtually undeployable. "People are beginning to question whether the fruits of America's vast military-industrial complex have anything to do with effective defence at all", he suggests.

There still seems to be a debate about whether the valves used in the Russian MIG-25 were to counter a nuclear electromagnetic pulse (emp) or "out-of-date" technology: though one notes that the Americans themselves are now pointing out that they have retained thermionic devices in the B-52 aircraft.

Icom 701—owners' report

For some time *Ham Radio* has been running the useful "owners' reports" on equipment which were originally introduced by the now defunct *Ham Radio Horizons*. These surveys are based on questionnaires completed by readers and represent the opinion and experiences of up to 100 or so owners. For example, the March 1981 issue had an illuminating report on the relatively "ancient" Collins KWM2 and KWM2A hf transceivers, valve equipment originally designed some 20 years ago. Virtually every owner of what (at the time) was a relatively high-cost equipment praised their remarkable reliability (some 37 per cent of owners listed this as its best feature, while 25 per cent put "stability" at the top of their list).

Solidstate equipments have usually not done so well in the reliability stakes, with the need to replace the output transistors (admittedly quite possibly sometimes due to operational carelessness) reported rather frequently.

The latest survey (*Ham Radio* October 1981, pp56–9) covers the Icom 701, an all-solidstate 100W p.e.p. hf transceiver of fairly recent design. A remarkably high 77 per cent of 90 owners say, yes, they would buy a 701 again, so making it one of the most popular rigs so far covered, though one has no idea how long, on average, they have been using them. In addition, 36·6 per cent of owners reported no problems, and 46 per cent had never had the rigs serviced (54 per cent had). One owner noted that the rig is "next to impossible to repair yourself because of its small size and board layout—and the instruction book doesn't help much".

A substantial 18 per cent of owners had had their output transistors blow; 5 per cent had had problems with other transistors (the same percentage reported bad solder joints). But it would seem that at least some of the output transistors had been replaced under warranty, even when their failure may have been due to inexperience in handling solidstate power amplifiers.

Almost 40 per cent had bought no accessories ("everything needed comes as standard"). Flexibility, quality of workmanship, performance, ease of operation, reliability and durability all scored Brownie points; price, maintenance and the instruction book came rather lower. The most disliked features were: reverting automatically to the bottom of the band when the rig is turned off; tiny knobs; and no passband tuning on cw. The small size (portability), dual-vfo, ease of operation and absence of tune-up were all very popular. In fact these surveys tell one almost as much about the owners as the equipment!

Antenna table

Most of the published tables of antenna element lengths do not include the new hf bands. To save pressing the keys on a pocket calculator, Table 1 shows lengths for selected frequencies for wire antennas erected well clear of the ground and away from other large objects; bends in the antenna may also increase the length required, and it is advisable to check elements with a gdo or noise bridge. In the table the second column represents the physical length of $\lambda/2$; the next column shows the usual end correction of roughly 5 per cent; the final column shows the correction deducted to the nearest inch. For antennas more than $\lambda/2$ long only one end correction should be deducted: for example, a full-wave antenna for 14,100kHz would be about 2 by 34ft 11in, less 1ft 9in, ie 68ft 1in, so that a given long-wire antenna will not resonate precisely on harmonic-related frequencies, although this is usually not of great practical consequence.

Table 1—Antenna resonant lengths

Frequency (MHz)	$\lambda/2$ (492/f)	End correction approx 5%	$\lambda/2$ resonant length (468/f)
1·825	269ft 7in	13ft 2in	256ft 5in (78·21m)
1·900	258ft 11in	12ft 6in	246ft 4in (75·12m)
3·525	139ft 7in	6ft 11in	132ft 9in (40·5m)
3·650	134ft 9in	6ft 6in	128ft 3in (39·11m)
7·020	70ft 1in	3ft 6in	66ft 8in (20·33m)
10·125	48ft 7in	2ft 5in	46ft 3in (14·1m)
14·050	35ft 0in	1ft 9in	33ft 4in (10·16m)
14·200	34ft 8in	1ft 9in	32ft 11in (10·05m)
18·100	27ft 2in	1ft 4in	25ft 10in (7·89m)
21·050	23ft 4in	1ft 2in	22ft 3in (6·78m)
21·200	23ft 3in	1ft 2in	22ft 1in (6·73m)
21·300	23ft 1in	1ft 2in	22ft 0in (6·7m)
24·940	19ft 9in	1ft 0in	18ft 9in (5·72m)
28·050	17ft 6in	0ft 11in	16ft 8in (5·09m)
28·400	17ft 4in	0ft 10in	16ft 6in (5·03m)
29·500	16ft 8in	0ft 10in	15ft 10in (4·84m)

There is an interesting possibility for 10·1MHz operation that has been brought to my attention by an unknown reader. The use of the same 67ft or so dipole for both 7 and 21MHz is well known, the antenna working as a useful $3\lambda/2$ dipole on 21MHz with its very attractive radiation pattern. A less precise, but roughly similar relationship exists between 10·1MHz and the cw end of 3·5MHz. The reader has checked his 3·5MHz antenna with a noise bridge and it looks quite good at 10·1MHz. If one takes 3×48ft 7in $-$ 2ft 5in, it turns out to be about 143ft, a shade long for 3·5MHz but certainly very usable! This also raises the possibility that antennas such as the G5RV may turn out to be quite efficient antennas for 10·1MHz without modification.

Using simple antennas

Most amateurs, when thinking about hf operation on 14MHz and above, have come to believe that the most important, virtually essential,

requirement is an effective beam antenna array—"the big signals win every time" is typical of the phrases often heard. A lot of amateurs in the UK, and more especially in some overseas countries, now use—even on cw—four or more elements at heights up to, or over, 70 or 100ft.

Undoubtedly super-arrays are effective, even under poorish propagation conditions, and can put signals into distant areas that would not be disowned by hf broadcasters! But designing, building and maintaining such monsters can represent a major engineering feat—or knock a very large hole into the assets of even the well-heeled. So if one agrees that such work has contributed tremendously to the development of amateur long-distance communications, one has also to admit that there is a very real danger that newcomers may be put off hf dx operation by the feeling that without such antenna systems they have little chance of raising dx, unless they are free to operate at times when the heavy mob are frantically trying to earn the money to pay for an even larger array.

Competition for really rare dx *is* stiff, and the British amateur is up against competition from the large number of well-equipped, high-power European stations. But it needs to be said that when the bands are open, there are usually even larger numbers of North American and Japanese stations seeking contact with Europe and well able to receive the weaker signals from the less well-endowed stations. Over many years it has remained true that simple, relatively low, wire antennas (dipoles, long-wires, verticals etc) continue to provide their owners with plenty of interesting contacts, particularly for those who are prepared to use cw (that sounds as though cw was onerous but ask any keen cw man which he prefers, cw or phone!).

As an example, using what most people would regard as an extremely poor 40m long-wire antenna (much of it indoors, none of it above about 25ft, and all of it heavily screened by trees and buildings) I note in my log a recent sequence of a dozen consecutive contacts on 14, 21 and 28MHz that included three Brazilian stations and one in each of: Ecuador, western Canada (VE7), Venezuela, Puerto Rico, India, Irkutsk (Siberia), Australia and Cyprus, as well as a short "pile-up" contact with Guinea-Bissau (J5). Admittedly two other "pile-up" stations—a V2 in newly-independent Antigua, and ZD9AA (Tristan da Cunha)—were not raised. But it does seem to show that it is still possible to enjoy dx contacts without a high, big beam that makes it all too easy. The contacts admittedly were all on cw, but then I still believe this is the ideal mode for international amateur working!

SWR—how important?

Questions relating to the myths surrounding the standing-wave ratio in coaxial feeders continue to interest and puzzle readers. Many still find it hard to understand why there is such a difference between the relatively small loss of radiated power arising from a mismatched antenna element/feeder junction compared with that which occurs when there is a similar mismatch between an electrical power source and its load.

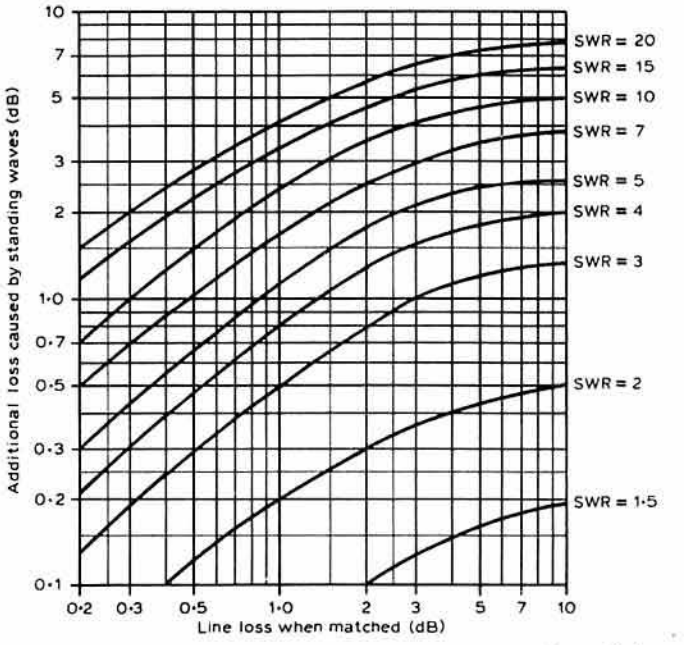


Fig 1. This is the standard graph that shows how much (or, at hf, usually how little) *additional* feeder loss occurs with a moderate vswr on a transmission line compared with the loss on the same line when there is unity vswr (ie swr = 1)

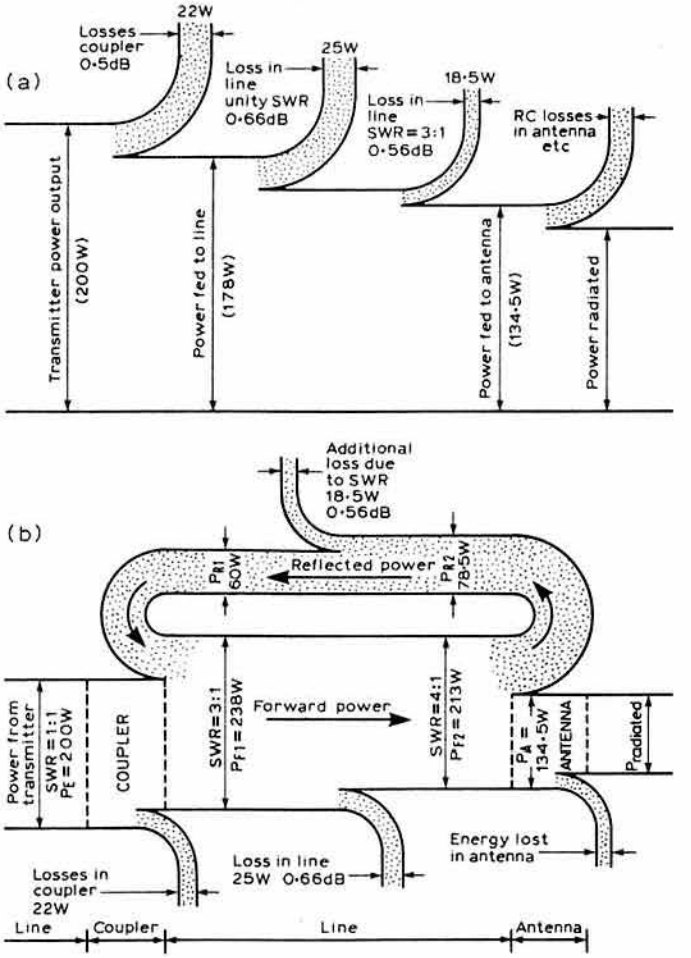


Fig 2. An ingenious French diagram that illustrates the effects of a mismatch to an antenna. Although a considerable amount of power may be reflected, most of this subsequently returns back up the feeder. Note also that swr measured near the antenna differs from that at the transmitter end, although there is usually very little point in measuring swr near the antenna. Note also that forward power, as measured, can be more than the true output power from the transmitter

Walter Maxwell, W2DU, several years ago summed up the confusion by writing: "Rational and creative thinking has for a long time been replaced by an unscientific and thought-inhibiting attitude, as in the days before Copernicus persuaded the multitudes that the universe did *not* revolve around the earth . . . the situation originated with the introduction of coaxial transmission lines for amateur use after we got back on the air after the second world war . . . good engineering is recognizing the correct choices in the compromises and realizing the right goals."

Perhaps the most difficult but most important point to grasp is that in a transmitting antenna reflected power is not basically lost power, although it does result in some additional loss of power each time the signal passes along the feeder: Fig 1.

Recently F6ELM (*Radio-REF* October 1981) has published an ingenious diagram which illustrates well the true situation: Fig 2. In this case a transmitter delivers an output of 200W, although, typically, 22W of power is lost in the coupling arrangements. With unity (1:1) swr the feeder loss amounts to 25W (0·66dB). With an swr of 3:1 (measured at the transmitter end) some 78·5W are reflected back, but the actual additional loss is only 18·5W (0·66dB) since the bulk of the reflected power is reflected at the transmitter end and comes back up the feeder again as "forward" power.

The diagram also shows that: **(1)** the swr measured at the transmitter end of the feeder (3:1) differs from that measured at the antenna junction (which more accurately represents the mismatch)—nevertheless there is little point in going to the additional trouble of measuring swr at the far end of the feeder, since the difference, if required, can be calculated; **(2)** the "forward" power other than when there is unity swr may well be more than the power output of the transmitter.

However, in showing so clearly that a moderate swr seldom involves any serious loss of radiated power, it has to be mentioned that this does not apply to a mismatch between feeder and receiver input circuits on reception. In

this case the reflected signal power is re-radiated from the antenna and is lost. Nevertheless, on *hf* unless the mismatch is serious the consequences are usually only marginal, since minimum usable signal levels tend to be set by external noise rather than receiver sensitivity and the critical s:n ratio of the signals delivered to the receiver will not be affected.

Lightning protection

A recent reference (*TT* December) was made to the need for better protection of solidstate equipment against the transient voltages induced into antennas and power lines etc by lightning; equipment connected to large mf and hf antennas is at most risk. It was then noted that telecommunications authorities now tend to pin their faith on carbon air-gap arrestors and two- and three-electrode gas discharge tubes. Gas discharge tubes will function a number of times but will eventually fail; it is an advantage if, when they do fail, they "fail-safe"; that is to say, they then provide a permanent discharge path by short-circuiting the input to the equipment.

It was therefore interesting to note that lightning surge protection for solidstate equipment, based on replaceable sealed gas-discharge tubes is now being offered on the American amateur market (Alpha Delta Communications, 116A North Main Street, Centerville, Ohio 45459, USA) under the name "Transi-Trap". A high-voltage model (HV) is intended to protect linears (over 200W) while the RT low-level protector is intended for solidstate receivers, transceivers and transmitters of less than 200W output: cost for each device is around £20.

The firm claims that: "Although a lightning-induced transient is very short (about 250μs) it can do enormous damage to semiconductors, even if not caused by a near-hit. Even a distant storm-front, out of the operator's sight, sends enough energy to ruin solidstate components, leaving no external sign of damage (especially to front-end pin diodes). The problem with a standard 'lightning arrester' is that it does not fire until a fast-rising lightning pulse has reached about 3kV or more. When it does fire, a fairly high 30 to 80V still exist across the arc; enough to damage semiconductors."

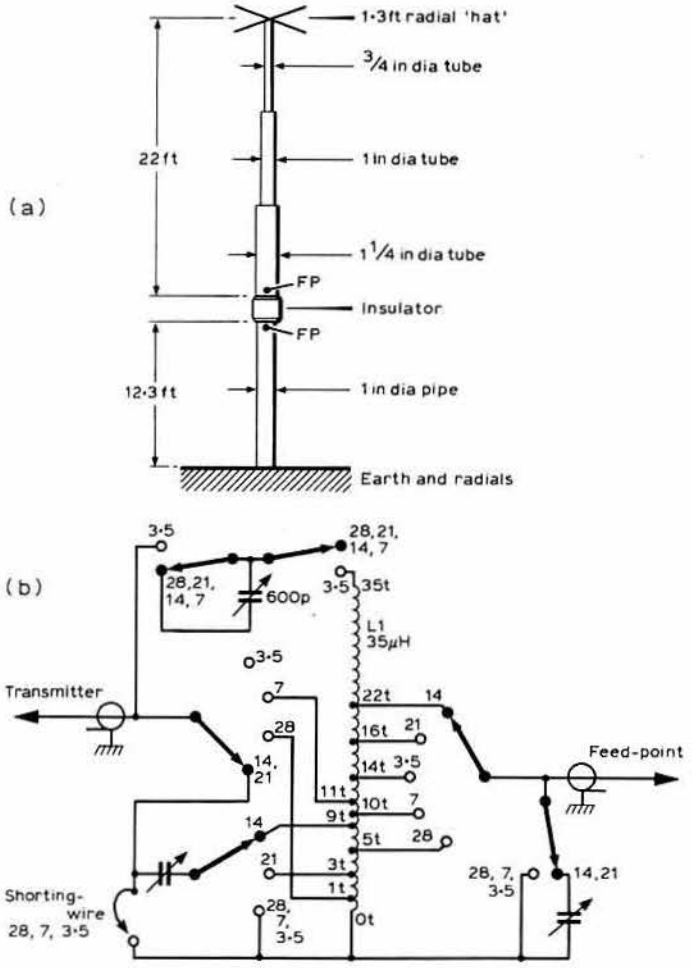


Fig 3. Practical realization of an elevated-fed multiband vertical antenna together with details of a matching unit located at the base of the antenna. Note that a very good earth is an important requirement, but the system provides colinear gain and concentrates more power at low angles of elevation. The 600pF variable capacitor can be low-voltage receiving type

The gas-discharge devices have about 100μs response time and have low voltage across the arc. Unlike some forms of transient protection, using diodes etc, they have no effect on the intermodulation characteristics or intercept point of a receiver. Although intended to minimize the hazards of lightning-induced surges, the makers point out that gas-discharge tubes cannot prevent fire or damage caused by a direct lightning stroke to the antenna or other nearby metal structures.

Elevated-feed multiband vertical

Some 15 years ago, I reported in *TT* that a vertical antenna offering the low-angle radiation characteristics of a vertical colinear array could be achieved by feeding a vertical element across an insulator placed one-third of the way up the element. This idea was derived from a Marconi hf direction-finder where, of course, it was used only in the receive mode, so that little practical experience could be quoted for its use as a transmitting antenna. The principle of elevated feed has been used in the broadcast field to provide anti-fading characteristics for vertically polarized ground-wave signals.

The elevated-feed principle was described in some detail, and this information, together with current distribution and vertical radiation pattern diagrams for antennas having a total height of from λ/4 to 1λ and showing a significant reduction of high-angle radiation, has since appeared in many editions of *Amateur Radio Techniques*. However, I must confess that this has, until now, been one of those items on which no feedback has ever been received.

However, Paul Pauliukonis, WD9AHH, in *CQ Magazine* (August 1981, pp94-6) describes "The better vertical-elevated feed means low angle of radiation" which he acknowledges is based on the *ART* information. His article includes a detailed account of his construction of such an antenna having an overall height of 34ft 4in and with a small "top hat" loading element: Fig 3(a). He uses the lower end of the 1in pipe as an earth spike, and also has earth radials—because for this type of antenna a good earth system is clearly necessary when used for transmission.

He comments: "I feel the elevated-feed principle has much to offer to the amateur radio operator. In fact I like this antenna so much that I am planning to optimize performance on 14 and 7MHz by designing and building one which will be 66ft tall." With the dimensions shown in Fig 3(a) he claims good dx on 21 and 28MHz, reasonable results on 14MHz, and useful performance on 3·5 and 7MHz.

Elevated-feed antennas do pose some practical problems: the insulator up the mast, and the requirement for voltage rather than current feed. WD9AHH avoids the need to have a matching network at the feed point by using a length of coaxial cable to the matching network shown in Fig 3(b) located at the base of the mast, the high swr on the short length of foam cable having little practical effect on results. The components in his matching unit were taken from an army surplus tuning unit. The system involves a rather complex matching arrangement, and I would stress that the system is recommended only where the earth conductivity is reasonably good.

Exploding batteries

On several occasions in the past (and in *ART*) attention has been drawn to the factors involved in any attempt to recharge standard "disposable" dry cells, including the way in which results can often be improved by using a dc charging current with a very high ripple content ("dirty dc"). There is currently a portable broadcast receiver on the market with a charging facility of this type, and the makers claim that the life of the small 9V transistor batteries can be extended by roughly four times.

Some 30 years ago the US National Bureau of Standards, in acknowledging that it is technically feasible to "recharge" conventional carbon-zinc Leclanche cells for a limited number of cycles, issued some sensible advice which included a warning that applies to the recharging of virtually any type of sealed cell: too high charging current is liable to give rise to excessive gassing and, if the cell is tightly sealed, this can result in a quite violent explosion.

The Bureau of Standards advice also included the following points relating to carbon-zinc cells: **(1)** operating voltage on discharge should not be allowed to fall below 1V/cell before recharging; **(2)** the battery should be placed on charge as soon as possible after it is taken out of service; **(3)** Ampere-hours of recharge should be 120–180 per cent of the discharge; **(4)** charging rate should be low enough to distribute recharge (*note*, charging rate for small transistor batteries may be only a few milliamps); and **(5)** cells should be put back into service as soon as possible after recharging since such cells have poor shelf life.

Exploding nicads

The above notes indicate that care must be taken when recharging any *sealed* cell, usually by severely limiting the charging rate, to avoid any possibility of explosion. With nicad cells the "one-tenth" charging rate appears to be

quite safe but the increasing interest in recent years in "rapid charging"—and the quite frequent use of chargers that do not incorporate the current limiting and constant-current characteristics normally recommended for nicad batteries—have resulted in some unfortunate accidents. For example, the following item was reprinted in the March 1981 *QST* from the *CVRA Repeater Journal*, illustrating the danger of recharging nicads from vehicle batteries without precautions:

"Many of the new hand-helds on the market today are operating with lower voltages—in the neighbourhood of 9·6V and some as low as 7V. Users are cautioned to use proper charging devices, especially proper cigarette-lighter-plug charging units in the mobile. At the Shelby Hamfest, Huland Gardner, WB4THL, was displaying his Yaesu FT202 that had one side completely blown out. Huland said he was charging his FT202 batteries by means of a normal cigarette lighter plug in his truck. The charging hand-held was lying on the dashboard in the sun. He believes that the combination of 13 to 14V coming from the alternator, and the hot sun, contributed to an explosion that 'sounded like a shotgun blast'.

"To be safe, buy the inexpensive cigarette lighter plug charging unit (with its built-in voltage dropping resistors) that is designed for your hand-held. If you must build your own, be sure to consider the voltage increase when your vehicle is running and, most importantly, do not exceed the recommended voltage for your hand-held."

Similarly in a recent letter in *Wireless World* (November 1981) Bernard Jones stresses that sealed nicad batteries subjected to rapid charging are liable to explode: he also makes the point that nicad cells, if accidentally short-circuited, can make the wire very hot indeed and so constitute a fire hazard.

A fourth warning comes from *Electronics* (22 September, 1981) on the danger of personal injury or extensive damage to equipment that can result from attempting to recharge nicad batteries from unsuitable chargers or when only a simple current-limiting technique is used: "This may cause the cells to overcharge and rupture, and they may also catch fire". Nicad cells should be recharged under scrupulously-controlled conditions, it is suggested.

Comparator regulated lead-acid battery charging

Even with a typical lead-acid car battery there are advantages in carefully regulating the charging current. The following arrangement is suggested in *Electronics* (6 October 1981, p142) by Ajit Pal of Calcutta.

He notes that as the charge builds up in a battery, its effective plate-charging area gradually decreases. In order to prevent damage it is an advantage if the charging current is continuously regulated to limit charging current with time. Fig 4 shows a charging unit for a 12V car battery using a μA710 ic comparator. This automatically adjusts the charging current by sensing the battery voltage, reducing the current as the battery voltage increases, regulating the current by controlling the on-off switching time of a thyristor (scr) placed in series with the battery.

A dc voltage proportional to battery voltage is applied to pin 3 of the 710 device with a potentiometer R1 determining the actual value. At the same time a ramp signal is derived from the positive line and fed to pin 2 (R2 setting the slope of the ramp). With the battery nearly discharged the voltage at pin 3 is nearly equal to the lowest instantaneous ramp voltage, with the result that the output voltage of the 710 is high and the thyristor remains "on" for almost all the 180° switching cycle. However, when the battery is almost fully charged the potential at pin 3 approaches the highest ramp voltage, and the thyristor is "on" for only a small part of the cycle etc. Maximum charging current is limited by R3 (0·5Ω, 10W).

Running hand-helds from car batteries

A number of popular hand-held 144 and 432MHz transceivers (eg Trio TR2400) are designed to operate from 9·6V battery supplies. Even with rechargeable cells it is often convenient to be able to run them directly from a 12V vehicle battery, always provided the equipment is adequately protected against excessive voltage (particularly when the car battery is on charge) and the regulated psu can cope with the considerable change of load (about 30mA on receive to around 600mA or so on transmit).

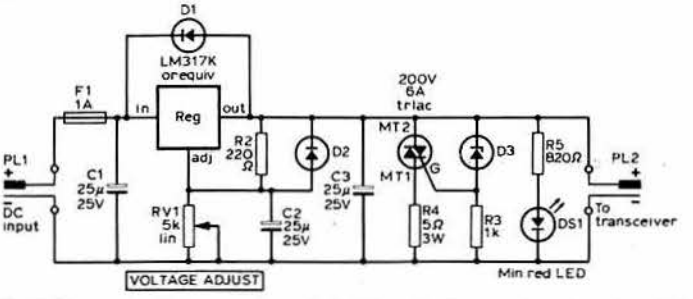


Fig 5. Adapter to allow operation of a 9·6V handheld transceiver from the 12V accessory socket of a vehicle. A 1A fuse and triac "crowbar" are required. D3 is an 11·5V 1W zener diode

Fig 5 shows a design by Raymond Charland, WA1IKJ, from *QST* that enables such transceivers to be run from a vehicle accessory (cigar-lighter) socket. The only modification to the equipment is a single-pole two-position switch in the battery pack cover to switch between the battery pack and the adapter. The charger jack can then be used for the adapter input as well as its original purpose (note that the adapter is *not* intended to be used as a charger for nicad cells). The unit includes fail-safe protection in the form of a 1A fuse and triac "crowbar" arrangement that operates if more than 11·5V appears on the output line. RV1 adjusts the output voltage and should be set to provide 9·6V. The l.e.d. indicator proved a useful addition to overcome intermittent, dirty contacts on the vehicle socket causing loss of the channel "memory". WA1IKJ built his unit with point-to-point wiring

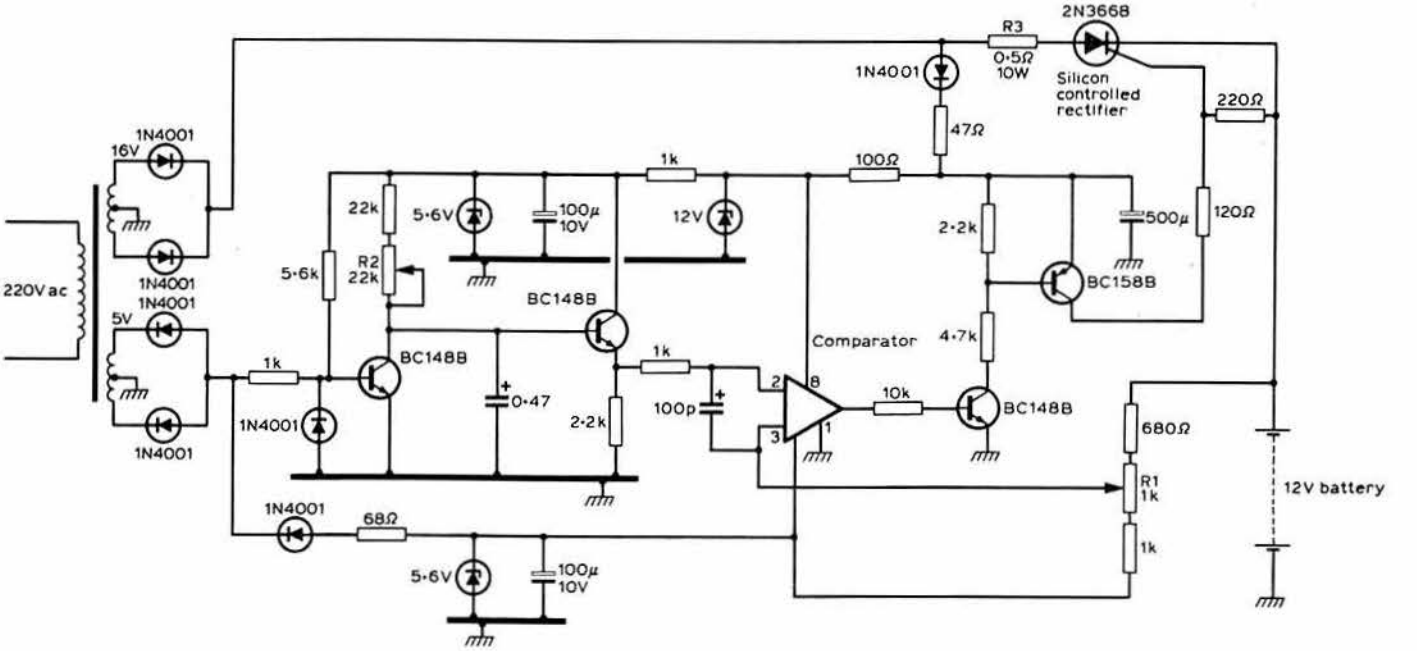


Fig 4. A charging circuit for 12V lead-acid batteries that progressively limits the charging current, by means of a 710 comparator which helps determine the extent to which the thyristor is fired over a 0° to 180° cycle

in a 1·125 by 2·125 by 3·25in plastic box with aluminium cover that formed the heat sink for the ic voltage regulator; note that the cover is at 9·6V positive and should not come into contact with the vehicle chassis, or the 1A fuse will be blown.

More milliamps from 7,660 voltage converter

In *TT* (June 1981, p534) some information was provided on uses of the Intelsil ICL7660 ic positive-to-negative voltage converter. This device is a complete high-efficiency dc-dc converter that can provide a negative dc line balanced to the positive voltage input line, so that (for example) devices such as op-amps can be fed from a single battery.

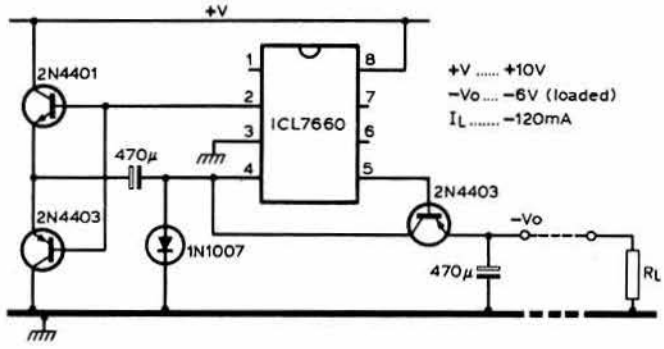


Fig 6. The use of external components to increase the current at negative potential available from the 7660 voltage converter ic. The arrangement shown can provide about 150mA instead of the 15mA or so of the 7660 unaided

However, for some applications the maximum current rating (about 15mA) of a "barefoot" 7660 is rather low. In *Electronic Design* (30 September 1981) Syed M. Ahmed indicates that by using a few external components it is possible to increase the output to at least 150mA at about −5V or −6V for an input of +10V. His modified arrangement, using two 2N4403s and a 2N4401, is shown in Fig 6: the use of higher value capacitors and better switching transistors could further improve the maximum output, he suggests. In effect the technique diverts charging current from the internal transistors and capacitors to the higher-rated external discrete components.

The flexible multimeter

John Osborne, G3HMO, warden of the South London Science Centre, was interested to see the suggestion (*TT* February 1981, p145, Fig 14) that an analogue ohmmeter could be calibrated directly in capacitance, by using the "kick" of the needle when the leads are first switched or connected across known values of capacitance. He writes:

"I have used the initial deflection that is obtained on connecting ohmmeter leads across a capacitor as a quick check that the component is in order. From experience one can guess the order of magnitude, and this is usually all that is needed as the marked value can then be taken as correct. If after a suitable pause the reading is taken again, then no deflection indicates no leakage. Reversing the leads after the first test and repeating the check should give double the deflection and so increases sensitivity if this is required. (The capacitor is in effect charged 1·5V positive and then the charge needed to charge it to 1·5V negative is indicated by the second deflection). Such low voltages do not seem to worry electrolytic capacitors, so that the polarity of the leads is not significant.

"The ohmmeter can also be used to test transistors. Initially the base-emitter and base-collector junctions can be identified and proved. Typically, for small-signal devices, the forward direction will indicate about 200Ω and the reverse reading between 10kΩ and infinity according to quality and whether silicon or germanium. It is not possible immediately to identify which is the collector and which is the emitter connection, but this can be found from the 'wet finger test'. The meter is connected across collector and emitter to provide a 1·5V supply; it indicates a very high resistance as the base is open-circuit. If a pair of licked digits are placed in parallel the resistance reading will go down. If the fingers are placed between collector and base, the reading will go down dramatically, showing the current amplification of the transistor. A little experience and such checks allow one to select gainy transistors, check doubtful ones, and so on. If one has accidentally interchanged collector and emitter, the gain is very low. One can thus find the connections to the transistor unambiguously.

"There is a catch in the above tests. The *marked* polarity of the multimeter leads is the opposite of the truth. This is because the 1·5V dry cell is inside the meter, and when one considers the circuit of a multimeter on the ohms range it becomes obvious that this will always be the case. To overcome mental torture I simply put the red meter lead in the negative socket and the black lead in the positive socket before starting such tests. In this way I know the red goes to the collector of an npn device and the black to the emitter.

"All this takes much longer to explain than to test five transistors. It is so much quicker than getting out a transistor tester, and usually provides all the information sought (such as 'is this a transistor or was it?'). An Avo multiminor is more versatile than the manufacturers realize. For a final example, consider a large inductance. This will show a more sluggish pointer deflection than an equivalent pure resistance, though in practice this is seldom a useful test, although quite impressive as a teaching demonstration."

Digital frequency doubler

The frequency of digital clocks (ie oscillators) is easier to divide than to multiply. But there are times when a higher clock rate is needed than can conveniently be obtained directly from many common ic devices. In *Electronic Design* (17 September, 1981, p187), Dan Lieberman, of Comsat Laboratories, shows how, by using a dual differential comparator device such as the NE521, it is possible to increase the frequency of the square-wave output of a typical ic device up to about 50MHz: Fig 7. Operation of this arrangement is described as follows:

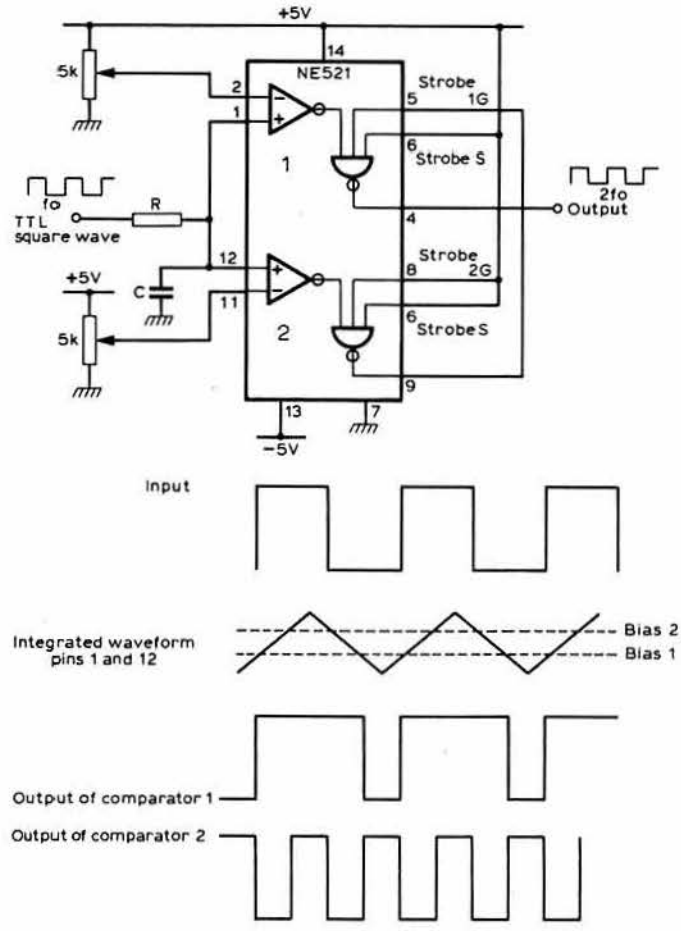


Fig 7. Digital frequency doubler. The frequency doubles when an incoming ttl signal, integrated by RC, is fed with a gated signal from the first comparator into the second comparator of an NE521 dual comparator device. The output of the second comparator will be double the input frequency. Suitable for use up to 50MHz output *(Electronic Design)*

"A square-wave signal is integrated by an RC circuit at the positive input of the first comparator (pin 12). The duty cycle of the output is determined by the threshold bias on the negative input of the first comparator (pin 11), as set by a 5kΩ potentiometer. The output going positive (pin 9) then acts as a gate for the input to the second comparator (pin 5). The duty cycle of the gated output is set by the bias setting on the negative input of the second comparator (pin 2). When the gate goes negative, the output goes positive, doubling the frequency."

MICROWAVES

Charles Suckling, G3WDG*

Measurement of receiver noise figure using ground noise

The subject of measuring receiver noise figure using the thermal noise emitted by the earth as a "standard" noise source has been described in this column before (July 1977). Recent advances in low-noise receivers, particularly on the lower microwave bands, require a somewhat more careful treatment of the measurements to obtain meaningful results.

The physical basis of the method of measuring noise figure using ground noise was described fully in the previous article, and will not be repeated here. The experimental method will be described again, however. The procedure is simple. The antenna is first pointed at the sky so that the entire antenna beam "sees" only the sky, with no trees, buildings etc in the way, and a measurement is made of the receiver noise level. The antenna is then pointed at the ground so that its entire beam "sees" the ground (but with the antenna not too close to the ground), and a second measurement of the receiver noise level is made. The difference between the two noise levels is then determined in decibels.

There are several ways of making the receiver output noise level measurements. A calibrated i.f. attenuator could be used to set the "ground" noise output to the same level as the "sky" noise output. The difference in attenuation settings is the required number. The receiver S-meter could be used to monitor the level, but should be set to a sensitive position, eg near S1–2, by adjusting the attenuator or detuning the preselector. Alternatively, the audio output could be fed to a meter, for example an ac voltmeter with decibel scale. In this case the receiver *must* be operated in a linear mode, such as ssb with the agc not operating (perhaps by switching the agc off if possible, or by ensuring by the use of suitable fixed i.f. attenuators, that the S-meter is just not operating when measuring ground noise). It is also worth checking that other parts of the system are not compressing (eg the audio stages). In all cases front-end noise must dominate—the indicated noise should be very small if the converter is disconnected.

Having measured the difference in noise levels with the antenna pointed at the ground and then at the sky, the receiver noise figure may be determined by referring to Fig 1. This relates the change in noise level to the receiver noise figure for different "antenna temperatures". The antenna temperature is related to the amount of receiver noise picked up by the antenna when it is pointed at the sky. This consists of galactic noise coming from the sky itself, pick-up of ground noise due to antenna sidelobes or spillover, and resistive losses in the antenna. The quantity varies with the type of antenna and with frequency. Between 1 and 10GHz the following approximate figures may be used: 20K for a low sidelobe horn, eg the W2IMU horn described here in October, 30–40K for a conventional horn, 50–60K for a 0·6f/d dish, and 30–50K for a well-designed Yagi. Clearly, uncertainty about the antenna temperature is the major limitation to the accuracy of the measurement, but at least one can obtain a good idea of the receiver performance, which cannot be so easily done by other amateur methods.

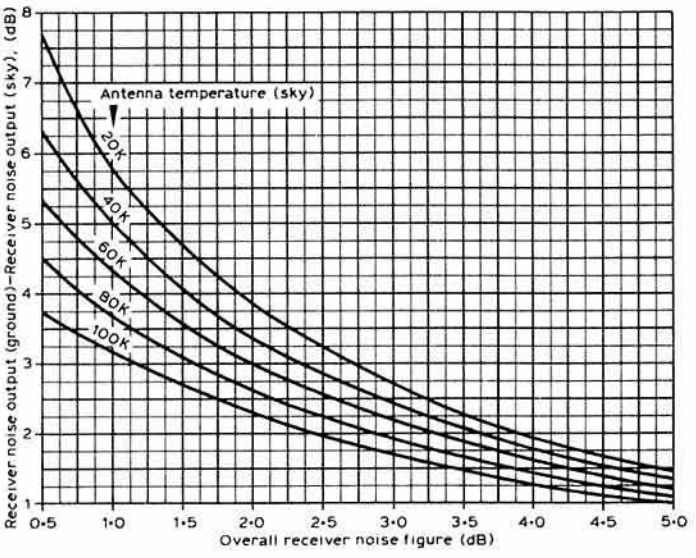


Fig 1. Receiver noise figure determination by sky/ground measurement

Finally, it should be noted that the noise figure obtained includes the effect of any feeder loss. If the feeder loss is known, it can be subtracted from the measured noise figure to obtain the actual receiver noise figure, although the measured figure is that which actually determines the overall performance!

Awards corner

Since the full list of Microwave Award holders published in November was compiled, the vhf/uhf awards manager, G5UM, has received a number of further claims. During October he received the first-ever claims from Europe for 1·3GHz awards. These came from DF4LY who lives in EO square, and were for a Microwave Distance Award (first contact beyond 600km) and for a 1·3/10 Squares Award. All RSGB microwave awards are open to members living overseas, and G5UM welcomes any further claims. The other awards issued went to G4KCT (1·3/5), G8MWR (1·3/10), G8FWA/A (Microwave Distance Award for 10GHz) and G8GDZ (Counties + Countries award for 1·3GHz).

Microwave QTH Square Award claim forms may be obtained from G5UM, QTHR, by sending an sae. Microwave Distance Awards may be claimed by sending the relevant QSL card together with a statement of the distance covered (plus return postage, of course).

Microwaves in Holland

In a recent letter, PA0EZ, the Dutch microwave manager, raised a number of points which will be of interest to UK amateurs.

On 2·3GHz, VERON is recommending that all Dutch narrowband activity should move up to 2,320MHz, in line with the recent developments in Germany. The nominal date for moving has been fixed as 1 January 1982, but many stations have already moved to 2,320MHz. Crystals have been ordered to move the PA0QHN beacon, and the PI3RTD repeater, up 16MHz. PA0EZ notes that activity in the UK could be better on 2·3GHz (he has only worked 8 G stations compared to 20 PA0), and wonders whether the UK is going to move to 2,320MHz. The current RSGB Microwave Committee proposal was outlined in *Microwaves*, September 1981, but it is intended to keep the matter under constant review. Any views on this subject would be greatly appreciated.

Operation on 3·4GHz in Holland is no longer allowed on a regular basis, but permission has been obtained for stations to operate in the 3,456–3,458MHz sub-band until further notice. At the moment approximately 12 stations are active on 3·4GHz, most of them using twts and 9W rf output.

Activity on 5·7GHz is very low in Holland, but four stations are reported to be building for the band.

On 10GHz, activity is growing rapidly on narrow-band. The following stations are QRV from home: PA0JME, PA0AXA, PA2DOL, PA0CRA (20W rf!), PA0EHG, PA0DBQ, PA0EZ, PA0JGF, PA0PJV and PE1BLE/A. The latter has had several one-way contacts with G3LQR, and PA2DOL has worked G3LQR two-way under good conditions.

PA0EZ's own best dx is PA0JGF (105km, under good tropo conditions) and PE1BLE/A (103km, under any conditions). DL9GS, who runs 8W output, has been heard at 175km.

PA0EZ feels that the PA/DL contest system has stimulated much microwave activity, since it is only possible to do well in their contests by operation on 1·3GHz (in addition to the lower bands), and that to stand a chance of winning it is necessary to operate also on the higher bands.

Both in Holland and in Germany, *all* microwave bands are included in the March, May, July and October contests.

He notes that apart from one or two notable exceptions, there seem to be very few G-stations active above 1·3GHz during these contests.

Round table reminder

The next Microwave Round Table is to be held at the usual Winchester venue on 17 January. Further details can be obtained from G3JHM, QTHR. □

*46 Windsor Close, Towcester, Northants

IARU 144MHz BAND PLAN with UK usage

	144·000	
	144·000	Spot frequency (UK use forbidden)
CW only	144·000-144·015	Moonbounce
	144·050	CW calling frequency
	144·100	CW ms reference frequency
	144·150	
	144·250	Used for GB2RS and slow morse transmissions
SSB and cw only	144·260 ±	Used by Raynet
	144·300	SSB calling frequency
	144·400	SSB ms reference frequency
	144·500	
	144·500	SSTV calling frequency
	144·540	Spot frequency (UK use forbidden)
	144·600	RTTY calling frequency
	144·600 ±	RTTY working (fsk)
	144·650	Raynet
All modes non-channelized	144·675	Data transmission calling
	144·700	FAX calling frequency
	144·750	ATV calling and talkback
	144·775	Raynet
	144·800	Raynet
	144·825	Raynet
	144·845	

Beacons only

	145·000	
	145·000 R0	
	145·025 R1	
	145·050 R2	
FM repeater inputs	145·075 R3	
	145·100 R4	
	145·125 R5	
	145·150 R6	
	145·175 R7	
	145·200	
	145·200 S8	Raynet
	145·225 S9	Used by Raynet
	145·250 S10	Used for slow morse tone modulated transmissions
	145·275 S11	
	145·300 S12	RTTY-afsk
	145·325 S13	
	145·350 S14	
	145·375 S15	
FM simplex channels	145·400 S16	
	145·425 S17	
	145·450 S18	
	145·475 S19	
	145·500 S20	FM calling channel
	145·525 S21	Used for GB2RS fm newscasts
	145·550 S22	Used for rally/ exhibition talk-in
	145·575 S23	
	145·600	
	145·600 R0	
	145·625 R1	
	145·650 R2	
	145·675 R3	
FM repeater outputs	145·700 R4	
	145·725 R5	
	145·750 R6	
	145·775 R7	
	145·800	
	Satellite service	
	146·000	

NOTES

Operation on the two spot frequencies is not permitted in the UK by the terms of the Home Office licence—see licence footnote No 4.

MS operation can take place up to 26kHz higher than the reference frequency.

The beacon band is exclusive. No transmissions should take place within this section at any time.

The satellite service band must be kept free of normal communication transmissions to prevent interference with this service.

The use of the fm mode within the ssb/cw section and cw or ssb in the fm-only sector is not recommended.

Repeater stations are primarily intended as an aid for mobile working and they should never be used for dx communication. FM stations wishing to work dx should use the all-mode section, taking care to avoid frequencies allocated for specific purposes.

UK 432–440MHz BAND PLAN

	432·000	
	432·000-432·015	Moonbounce
CW only	432·100	CW random ms
	432·150	CW calling frequency
	432·150	
	432·200	UK ssb calling frequency
SSB and cw only	432·300	IARU ssb calling frequency
	432·500	
	432·500	SSTV calling frequency
	432·525-432·575	1·3GHz/432MHz linear transponder output
All modes non-channelized	432·600 ±	RTTY working (fsk)
	432·600	RTTY calling frequency
	432·675	Data transmission calling
	432·700	FAX calling frequency
	432·800	
	Beacon sub-band	
	433·000	
	433·000 RB0	
	433·025 RB1	
	433·050 RB2	
	433·075 RB3	
	433·100 RB4	
	433·125 RB5	
	433·150 RB6	
FM repeater outputs in UK only	433·175 RB7	
	433·200 RB8/SU8	Used by Raynet
	433·225 RB9	
	433·250 RB10	
	433·275 RB11	
	433·300 RB12/SU12	RTTY repeater and rtty afsk working
	433·325 RB13	
	433·350 RB14	
	433·375 RB15	
	433·375	
	433·400 SU16	
	433·425 SU17	
FM simplex channels	433·450 SU18	
	433·475 SU19	
	433·500 SU20	FM calling channel
	434·600	
	434·600 RB0	
	434·625 RB1	
	434·650 RB2	
	434·675 RB3	
	434·700 RB4	
	434·725 RB5	
	434·750 RB6	
FM repeater inputs in UK only	434·775 RB7	
	434·800 RB8	
	434·825 RB9	
	434·850 RB10	
	434·875 RB11	
	434·900 RB12	RTTY repeater-afsk
	434·925 RB13	
	434·950 RB14	
	434·975 RB15	
	435·000	
Satellite service		
	438·000	
	434-440	Sub-band devoted to UK atv-frequencies chosen so as to avoid interference to other band users and, in particular, the amateur satellite service
	440·000	

UK 70MHz BAND PLAN

	70·025	
Beacons only		
	70·075	
CW only		
	70·150	
SSB and cw only	70·200	SSB calling frequency
	70·260	
	70·260	National mobile calling frequency
All modes	70·300	RTTY calling frequency
	70·350-70·400	Raynet
	70·400	
FM simplex only	70·450	FM calling frequency
	70·500	

4 - 2 - 70

John Morris, G4ANB*

Happy New Year

January is here again, so it is time to make the annual appeal on behalf of the band plans published in this issue. The reasons for having band plans, and the importance of following them, have been discussed many times in the pages of *Rad Com*, but with the number of amateurs on the bands growing apparently exponentially, and several thousand new members having joined the Society during the past year, I make no apology for returning to the theme once more.

The band plans are designed to separate incompatible activities, letting all vhf/uhf users follow their own particular interests with a minimum of interference to and from others. The two most popular transmission modes, fm and ssb, both have their advantages, but each can be completely disrupted by the presence of the other on the same or a nearby frequency. Clearly, it makes sense to keep these two modes in different sections of the band and so reduce the risk of interference to users of both. Similar comments apply to the other divisions in the band plans. Repeaters, for example, cannot change frequency and should always be available for mobile operators, so they are given their own allocations to keep them clear of simplex operation.

Probably the most common contravention of the band plans is transmission in the 144MHz beacon sub-band, 144·845–144·990MHz. In many ways the attractions of this part of the band, especially for the operator who uses 144MHz mainly for local working with only a modest antenna, are understandable. It may appear completely empty and seemingly never used, and so look like an ideal spot for a quiet contact. Do not be deceived; no matter how empty the beacon band appears, there are many weak signals there, and there are people listening to them. Most vhf beacons run low power and use simple antennas, comparable in fact with a typical amateur station for local working. Even so, under the right conditions beacons can be heard many hundreds, and even thousands of kilometres away. Helping operators detect "the right conditions" is one of the purposes of vhf beacons, and any other transmissions in that part of the band will cause inconvenience and annoyance to many people over a wide area.

Remember, the band plans are designed to allow all of the many activities which take place on vhf/uhf to co-exist and make the best use of the limited bandwidth available, but they can only work if *everybody* follows them. After all, how can you expect other operators to respect *your* interests if you do not respect theirs?

One question often asked is "What should I do if I hear somebody else operating outside the band plan?" There is no "official" answer to this as, in theory, everybody should follow the band plans all of the time and the question should not arise. In practice, contraventions do occur, and most operators will have heard them. The one thing not to do is ignore it and then complain at the next club meeting or on the air about "these people who seem to have never even heard of the band plan". Perhaps this is the case; there are amateurs who are not members of the RSGB, and who may not have encountered the band plans.

The best approach is probably to call the offending station on the same frequency and mode as that station is using and explain, politely, about the band plans and why it is so important for everybody to stick to them. Admittedly this involves contravening the band plan oneself, but in the long run it is better to have just one extra, short transmission in the wrong part of the band than to let an operator carry on making himself unpopular without realizing it. Even if the other station replies "My licence says I can operate here, and I will", and cannot be made to see the advantages of amateurs co-operating with one another, if enough people repeat the same message it may eventually get through. Ultimately, nobody can be *forced* to follow the band plans, but if 99 per cent of operators keep to them the remaining one per cent will soon follow suit, to the benefit of all.

*c/o RSGB HQ, 35 Doughty St, London WC1N 2AE.

70MHz transatlantic

Amateur 70MHz signals again crossed the Atlantic on 4 November when VE1ASJ was worked on 28–70MHz crossband by G4JCC and GW4HXO at 1356 and 1422gmt respectively. Both UK stations used cw on 70·1MHz, while VE1ASJ replied using ssb. The GW4HXO–VE1ASJ contact was a GW–VE 70MHz crossband "first". The contacts were made possible by the same unexpectedly high levels of solar flux which were responsible for the 50MHz transatlantic openings described elsewhere.

GW3MHW has reported that VE1ASJ has obtained permission for a beacon on 70·1MHz, which he hopes to bring on the air during the winter. VE1ASJ will also be listening for UK stations on the same frequency, where there is a "window" between the sidebands of the local tv transmitters. This window is only 4kHz wide, so hopeful 70MHz operators should make sure their frequency is correct to within 1kHz. Several other North American stations are also reported to be setting up 70MHz receiving equipment, including WD8ISK and W3XO.

Super-refraction

There were good 144 and 432MHz openings from parts of the UK to the northwest corner of Spain on several occasions during early November, apparently by marine ducting/super-refraction. G4IFX (YN57j) worked EA1ED (VD59h), EA1QJ (VD59h) and EA1TA (VD58b) on 144MHz between 2133 and 2218gmt on 2 November, and commented that these three and EA1CR (XD32d) apparently worked most of England during the evening. EA1CR was also worked by G8LFB (ZL30f) at 1043gmt on 3 November.

EA1QJ and EA1TA were both good signals again on 144MHz during the early evening of 6 November, and were heard or worked by stations as far afield as GI8NBW (WP79g), GM4CXM (XP09g), GM4IHJ (YQ73c) and G8LFB (ZL30f). GM4CXM also worked F1FHI (ZH63d) at about 1820gmt.

The conditions recurred on the following day, fortuitously coinciding with the start of the 144MHz CW Contest. EA1RCA (VD59h) attracted a large pile-up on cw, and EA1TA was worked by several stations again. GM4IHJ heard at least one CT1 station, while on ssb GM4CXM netted EA1ED. GM4CXM also commented that F6KBF/P (AJ14j) was audible at good strength throughout the contest.

At 2000gmt on 7 November GI8NBW worked EA1CR on 144MHz. The two stations then moved up to 432MHz, and after some difficulty completed a contact on that band, even though EA1CR was running only 10W. The distance between GI8NBW and EA1CR was 1,282km, which GI8NBW believes may be a 432MHz dx record for Northern Ireland. Are there any other claimants for this record?

With his band report, GM4IHJ made some interesting observations on these propagation conditions: "I have been intrigued by discussion of recent marine ducting/super-refraction. There is a general impression that these effects are tropical or warm-temperate only, but my radio warfare experience suggests these effects are just as common in the Arctic. I think we should look for these ducts on the days when the sea is calm and the air just above it very cold. These ducts can be very thin – raising a periscope 1ft higher could put the pick-up waveguide horns out of the duct, as I know to my cost."

Aurora

As reported briefly last month, there were good 144MHz auroral openings on 20 and 22 October, just after the deadline for that issue, and several more reports have since been received. The earliest contacts on 20 October were reported by GM3JFG, who was kept busy continuously from 1519 to 1853gmt, working stations in 10 different countries. Among the best dx were SM5CNF (HS49f), OZ1DOQ (GP34h), DK7AW/A (FL12c), OK1KKH/P (HJ06c) and SM3ULF (IV52b). GM3JFG also noticed a phenomenon which he has observed on previous occasions; as the aurora faded at 1856–1900gmt, signals from the northeast lost the characteristic auroral rasp, and started to become T9. A second phase at 1940–2047gmt produced contacts with DF5JJ (DL44g) and several G, EI, GI and SM stations. The last auroral contact of the day for GM3JFG was with GM4IPK (YP05h) at 2317gmt.

GM4CXM (XP09g) worked SP6BQA (IK30j) and SP6ASD (HL39c) at about 1700gmt. Noticing both stations were close to the Czechoslovakian border, GM4CXM sent a "QRZ OK", and received a reply from OK1KKH/P (HJ06c). Other stations worked included OZ1DOQ (GP34h), F6DKW (BI12f) and LA7KK (FU62j).

G4IFX (YN57j) used the event to demonstrate yet again that although big antenna systems are useful, it is still possible to enjoy dx working without them. Between 1732 and 1937gmt G4IFX worked several stations by aurora, including GM3WCS (YQ73c),EI9BG (VM27c) and DF1ZE (EJ13e), using

just a two-element ZL-Special in the shack. G4IFX is now up to 44 squares and 14 countries worked on this indoor antenna.

GI4LKA (XO21j) missed most of the dx on this occasion, but has reported the observation by GI4FFL and a party at the Armagh Planetarium of a large visual event to the north. A steerable crossed Yagi was available and showed signals peaking from due north, and at 5° to 10° elevation, with circular polarization being favoured.

GI4LKA fared rather better during the afternoon of 22 October, when very strong Continental signals were heard on a beam heading of NNE. Among the dx worked between 1538 and 1655gmt were F6DWG (BJ41j),PA0THT (DM65h) and ON5CG. GI4FFL in Armagh picked up LA3EQ (CS29h) at 1820gmt.

GM3JFG was again active for the 22 October event, and worked several West German stations, as well as Y38ZA (HN02c), between 1710 and 1751gmt. GM3JFG also heard DL7ZL (GM square) calling "CQ" on cw on 432MHz for about 3min from 1810gmt. The 432MHz signal slowly faded out, and when GM3JFG returned to 144MHz all had gone quiet there as well. At 2030-2110gmt there was a second phase, during which GM3JFG worked LA9FY (EU36j).

For G8LFB (ZL30f) the 22 October aurora produced several good 144MHz ssb contacts, including GM4LPG (YR52f) and DD4LT (EN08a) between 1415 and 2005gmt. On cw GM3VTB (XP09j) needed only 10W from his TS700S and a 10-element beam to work DF6OB (FM44c), DK5FA (FK01g) and DL4FAK (EJ24h), among others, between 1530 and 1730gmt.

While listening to these two auroras GM4IHJ was struck by how difficult it can be for stations running low power to make themslves heard. GM4IHJ is not against high power, believing anyone who goes to the trouble of putting a highly effective station together is entitled to all the dx he can work. Nevertheless he wonders if it would be possible to get support for a proposal to set aside two patches about 20kHz wide, one cw and one ssb, where only stations running 10W or less could call "CQ", but anyone could go in and reply. Although this idea could result in protests about "more and more regulations", GM4IHJ suggests it might just possibly let some good dx in, which would be worth a bit of regulation. This idea certainly seems worth considering; what do you think?

50MHz

Old Sol was unexpectedly kind to 50MHz enthusiasts during the autumn, giving a far better dx season than had been predicted. The F2 critical frequency reached levels equal to those of the same period in 1980, in spite of being a year further past the solar maximum. The solar flux on 16-18 October reached 305 units, the highest level of 1981, and among the highest for the whole solar cycle. This solar activity produced a series of fine 50MHz openings, with correspondingly high levels of activity on 28-50MHz crossband.

My thanks to G5KW, GW3MHW, G3WBQ, G4BPY and GM4IHJ for supplying logs from which the following extracts have been taken. Stations in and around the Caribbean featured in most of the logs. Some of those heard or worked in the period 16 October-13 November were HI8DAF, DL3ZM/YV5, VP2VGR (Virgin Is), K2QIE/8P6, HC1FM, 9Y4LL, 8P6KX, HC8VHF, PJ9EE, TI2NA, KV4FZ, and the FY7THF beacon (50·039MHz), which was heard on many occasions.

Conditions were also good on the north-south path, with ZS3E, ZS5TR, ZD8TC and many EL and ZS6 stations being reported. On 8 November G5KW worked C5AEH for a G-C5 crossband "first".

In between all of these exotic (to a vhf scribe) callsigns, literally thousands of crossband contacts between the UK and North America were made, sometimes by unusual propagation modes. G4BPY worked WA1EKV on 26 October by sidescatter, with both stations beaming towards the Caribbean, which gave much better signals than the great circle path. G5KW was pleased to find N6AJ, K6MYC, WA6PEV and K0GUV on 13 November. G3WBQ commented that it was fascinating to hear G5KW on the Isles of Scilly giving S9 reports an hour or so after the 50MHz signals had faded out in Surrey.

ZB2BL is extremely fortunate in being one of the very few European operators licensed for transmission on 50MHz, and has challenged the claim by SM6PU (October *4-2-70*) for the first reception in Europe of amateur 50MHz from Japan. On 10 April 1980 ZB2BL worked JA1BK direct on 50MHZ, and has since made around 200 contacts with JA stations. Since the beginning of 1981 ZB2GW/G8GYC has also been active on 50MHz, and worked into Japan during the recent openings. All of the ZB2-JA contacts were made via long path, as Asia is very well screened from Gibraltar on the short path by the Rock itself. ZB2BL has also provided detailed summary sheets of 50MHz openings from Gibraltar to various parts of the world over the past three years, clearly showing the build-up in propagation to the solar maximum.

GW3MHW often receives letters of thanks from USA stations for the 28-50MHz crossband activity. At his request I am happy to pass these thanks on to crossband operators through these pages.

70MHz ms

G4IJE, G8VR, SP2DX and YU3ES have been carrying out a series of 70MHz meteor scatter tests. During the summer, G8VR managed to interest YU3ES in listening on 70MHz, and so G4IJE put together a suitable converter and sent it to the Yugoslav station, who attached it to a two-element beam made from parts of an old tv antenna.

At 0500gmt on 8 November G4IJE (AL12g) and YU3ES (GF39d) completed a 70-144MHz crossband contact by ms-a G-YU 70-144MHz "first"? The contact took just 30min to complete, and on 70MHz YU3ES received 16 bursts, the longest lasting 8s, from G4IJE. On 70MHz transmit G4IJE was using a transistor pa with 50W input and a five-element homebrew Yagi at just 4·5m agl. At 0500gmt on 14 November a similar sked between G8VR and YU3ES was equally successful. On this occasion YU3ES received 11 bursts on 70MHz, the best 14s long. G8VR's 70MHz station uses a QQV07-50 pa and a four-element Yagi at 8m agl.

G8VR and G4IJE have also carried out 70MHz ms tests with YU3ES and SP2DX, during which the two UK stations transmitted simultaneously just 300Hz apart for 10min periods. Both SP2DX and YU3ES reported that out of more than 100 bursts received in three separate tests, only about half a dozen contained signals from both transmitters, even though G8VR and G4IJE are only about 50km apart and were using similar antennas and power levels.

G8VR and YU3ES are now planning a further series of tests to compare bursts on 70 and 144MHz. G4IJE, QTHR, is also interested in hearing from anyone within ms range who is operational on 144MHz ms and can receive on 70MHz.

Considering the low erps compared with most 144MHz ms systems, and the modest receiving antenna used by YU3ES, the crossband contacts show just how good ms propagation is at 70MHz, and it is a pity that more opportunities to exploit it do not exist. However, although not as good as the "real thing", crossband working makes a good substitute, and over the past couple of years several UK operators have combined 70 and 144MHz to complete ms exchanges with European dx stations. There is clearly a good deal of interest in this type of operation, both in the UK and elsewhere, and I would be most interested in hearing from anyone else who has made similar trials.

Repeater news

The new Vale of Aylesbury vhf repeater, GB3VA (R4, 16km west of Aylesbury), came on the air on 21 November. GB3WH, which formerly operated on Ch R4 from Abingdon, closed down on the previous day in preparation for moving to a site near Swindon and changing channel to R2. The combination of GB3VA and the newly-sited GB3WH is expected to fill a large gap in the coverage of the vhf network in the area.

GB3VA is tone accessed and carrier re-accessed with no time-out. The callsign is sent in 875Hz tone before close-down at in 1,750Hz every 15min.

While GB3WH is off the air the opportunity will be taken to completely upgrade the hardware, and so the move may take a few weeks. It is hoped that GB3WH will be operational from its new site in 1982.

It would seem, therefore, that the long saga of vhf repeater coverage in this part of the country is at last entering its final chapter. One point raised by GB3VA coming on the air is that with only eight 144MHz repeater channels available, and four of these in use by the London repeaters, it is inevitable that some of the repeaters surrounding London must share channels. Therefore fixed stations who insist on using omni-directional antennas to work through repeaters may find some co-channel interference, but the mobiles for whom the networks are designed should experience few problems.

The Repeater Working Group is currently processing proposals to be included in the 1982 batches of submissions to the Home Office; vhf Phase 6 and uhf Phase 7. Most of these are still at a very early stage, with most of the technical vetting procedure to be gone through, but proposals have been accepted in principle for uhf units in Leeds city centre (GB3LA, RB13), Kidderminster (GB3KR, RB4), Hawick (GB3HK, RB14) and Guernsey (callsign and channel to be decided). In addition GB3GH, which was held back from uhf Phase 6, should be included in Phase 7, and a new rtty repeater, to be given the callsign GB3RY and operate on Ch RB12, has been proposed for Ealing. On vhf a proposal for a unit in the Shetlands held back from a previous phase (GB3LU, R3) should go in with Phase 6. All of these callsigns and channels may be subject to change before submission.

There are currently three uhf repeaters off the air because the groups

which brought them on have disbanded or have lost vital technical support. In one case a group lost half its manpower when one person, who happened also to be the siteowner, left the area. This is why "one man band" repeater groups are strongly discouraged. The three repeaters are GB3NN (RB2, north Norfolk), GB3WS (RB6, Suffolk) and GB3HN (RB11, Hitchin, Herts). In all of these cases there are now one or more local groups proposing to take over the licence, which is a very healthy sign for the future of the repeater networks.

When a new group takes over an existing repeater licence the full vetting procedure must still be followed, both to make sure a reliable service will be maintained, and also to make sure members of the group are well aware of just what they are getting involved with. The Home Office must then be consulted, as the change of group will almost certainly entail a site change and new close-down procedure. The only short-cut is that the Home Office have already agreed a repeater should be operational in the area, and so the full proposal does not need to be re-submitted in one of the annual batches.

GB3MT—the electronic letterbox

GB3MT is a new rtty and data repeater with a number of novel features being built by members of the UK FM Group (Western). It will be located at the IBA tv transmitting station on Winter Hill, near Bolton, and will operate on Ch RB12.

GB3MT will be able to handle two code formats; ASCII and the normal rtty code, CCITT No 2 (commonly, if incorrectly, called "Murray code"). ASCII will use the CUTS or Kansas City standard popular with home computer users; 1,200Hz space and 2,400Hz mark at 300baud. The rtty system will use the current amateur afsk standard of 1,275Hz space and 1,445Hz mark at 45·45baud.

GB3MT will regenerate incoming signals rather than simply relaying them. In other words, incoming signals will not just be demodulated to audio and then retransmitted, but will be fully decoded by the control unit and then re-encoded for transmission. This means that GB3MT will not be able to relay phone transmissisons, but it will be possible to include the facility of a "crosstalk" mode, where an ASCII signal can be regenerated as normal rtty, or vice-versa. This will allow traditional rtty operators to communicate with those equipped with home computers, and it is hoped that this will help forge a common bond between the two.

Also available will be 1kbyte long code stores, so that a user can store any message or data for subsequent retrieval by another station. For this reason GB3MT has been dubbed "the electronic letterbox". At a later date it may be possible to give GB3MT some real computing power which would be available to those able to operate their equipment in full duplex. Telemetry facilities are another obvious possibility, and ideas about this are being canvassed.

The logic system for GB3MT will be based on a Z80 microprocessor, and it is hoped that the unit will be operational by April. Technical information can be obtained from G8DVR, QTHR. GB3MT is supported by the UK FM Group (Western), which is responsible for an impressive total of 15 repeaters, including one microwave and one tv. Further information on the group may be obtained from G3LEQ, QTHR, the group secretary, who very kindly provided the above information on GB3MT. No doubt an sae with any enquiries would be appreciated.

Awards

The battle at the top of the unofficial squares league is hotting up. Little more than a month after the claim from G3IMV reported in last month's *4-2-70*, the vhf awards manager received a packet of cards which took Mike Lee, G3VYF, of south Essex up to 209 squares and 41 countries confirmed on 144MHz. G3VYF also expressed the hope that the 4-2-70 Squares series of awards would be extended at the top. The best way of doing this is currently being discussed, and your suggestions would be most welcome.

In the less exalted categories of the Squares awards, stickers Nos 9 and 10 for 100 squares and 20 countries on 144MHz have gone to G8VR and G3NAQ respectively. Basic 144MHz 40 + 10 certificates Nos 62 and 63 have gone to G8WPD and G8KAX. G8KAX has also taken 432MHz 30 + 6 No 12.

On the Four Metres and Down front there is no slackening of claims. 70MHz Standard No 140 has gone to G4ERP for operation as GW4ERP/P, while 144MHz Standards Nos 591-594 have been taken by G8NQP, G8MLJ, G8KPZ and G8XTJ respectively. G8XBB and G8ZRR have both taken the 144MHz Senior, becoming the first G8X-- and G8Z-- licensees to do so. On 1,296MHz the latest claimant was G8GDZ, who has been awarded Standard No 29.

The vhf awards manager, G5UM, has made a couple of points about award claims. The first is that certificates can be endorsed with any special features of the claim, such as "cw only", or "first G9". Say how you would like your certificate endorsed if there is anything out of the ordinary about the claim, and the vhf awards manager will oblige. The second concerns the perennial problem for award chasers of getting the requisite QSLs. A confirmation need not be in the form of a card; any piece of paper will do, so long as it shows the callsigns, date, time, band, mode and QTH/QRA.

30 and 20 years ago

"Two metre activity has been at a far lower level than it was a few months ago in the north of England, but the same criticism can hardly be applied to the eastern part of the country. Nor can the lack of activity be laid at the door of V.H.F. conditions, for not only was a good Continental opening enjoyed by East Anglian stations in the middle of the month, but 70 cm. is still yielding ranges in excess of 100 miles to those enterprising enough to try their luck on the band."—G2UJ in *Around the V.H.F.'s*, January 1952.

"The frequency of the Society's v.h.f. beacon transmitter at Wrotham Hill, Kent, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144·50 Mc/s).

Date	Time	Error
December 5, 1961	11.55 G.M.T.	910 c/s high
December 12, 1961	11.22 G.M.T.	796 c/s high
December 19, 1961	12.00 G.M.T.	1,526 c/s high
December 26, 1961	12.09 G.M.T.	2·055 kc/s high

The station is in operation from 06.30-23.59 B.S.T. daily, but may be on for the full 24 for test purposes from time to time."—G2AIW in *Four metres and Down*, January 1962.

Scatter

ZB2BL has kindly sent information on the current status of the three ZB2VHF Gibraltar beacons:

Frequency (MHz)	Power (W)	Keying mode	Antenna
50·035	30	A1 or F1	5-element Yagi
70·120	16	F1	5-element quagi
144·145	10	F1	12-element Yagi

The 70MHz beacon is normally beaming towards the UK, but the 50 and 144MHz antennas are moved according to the prevailing propagation. All three units are normally operational 24h a day, except when ZB2BL is on the air or monitoring the vhf bands. For propagation research purposes ZB2BL would be very interested in receiving any reception reports of the beacons. They should be sent: J. Bruzon, ZB2BL, 27/2 Flat Bastion Rd, Gibraltar.

At 1950gmt on 15 July 1981, GM8JYU and ZB2BL made contact on 144MHz by sporadic-E. Are there any earlier claimants for a GM-ZB2 contact on 144MHz, or was this a "first"?

GI8YDZ (WP67b) suspects he is the only active 144MHz ms operator in WP square, and is very keen to make skeds for this mode. During the 1981 August Perseids GI8YDZ completed ms contacts with DC7OH and Y22ME, and is now planning to run full legal power into a 19-element boomer at 14m agl. European ms operators interested in a sked with WP should write to: A. Doherty, GI8YDZ, 14 Rodney St, Portrush, Co Antrim, N Ireland.

To promote interest in rtty operating on vhf/uhf the British Amateur Radio Teleprinter Group has introduced a range of awards, available for hearing or working sufficient stations on rtty. There are three awards, one for each band, and the qualifications are as follows: 144MHz, 100 stations heard or worked; 432MHz 50 stations; 1,296MHz 10 stations. Stickers are available for each additional 25 stations (10 on 1,296MHz) up to a maximum of 200. The full rules can be obtained by sending an sae (or one irc if outside the UK) to: Ted Double, G8CDW, BARTG contest and awards manager, 89 Linden Gardens, Middlesex.

Ron Broadbent, G3AAJ, the ever-energetic secretary of AMSAT-UK, has very kindly passed on an item of satellite news. The three new Soviet amateur satellites will transpond signals from 145 to 29MHz, with the following frequency plan (frequencies in megahertz): No 1, 145·86-145·90 to 29·36-29·40; No 2, 145·91-145·95 to 29·41-29·45; No 3, 145·96-146·00 to 29·46-29·50. Each satellite will also carry two beacons, one at each extreme of the respective 29MHz downlink passband. One or more of the satellites should be in orbit by the start of 1982.

Your peripatetic scribe is on the move again. By the time this is published I should be ensconced in a new job and location in London (which, in my northern chauvinist way, I cannot help thinking of as "that big place just south of Birmingham"). The new address has not been settled at the time of writing, but RSGB HQ has kindly agreed to act as an accommodation address for *4-2-70* until the details are sorted out. For this reason the deadlines are a day earlier than usual. All news and views for March to arrive at **RSGB HQ** by 15 January (late news by 26 January) and for April by 19 February (late news by 1 March) please. □

THE MONTH ON THE AIR

John Allaway, G3FKM*

ALTHOUGH SEEMINGLY FAR AWAY at the time of WARC in 1979, 1 January 1982 has arrived. One new hf band is already in use at the time this is being read, and hopefully further news of two others will be available soon. The 10MHz band promises to be of extreme interest—particularly later in the declining sunspot Cycle 21 when even 14MHz will only carry signals for part of the day during mid-winter. The agreement to restrict use to narrow-band modes was taken to enable the maximum number of people to use it and not in any way as an "anti-ssb" move, and it is hoped that this gentlemen's agreement will be respected. There will be no credit for DXCC on the new band and no contests. Careful observers will have noted that IARU decided that awards as such should not be banned—the reasoning being that it would be impossible to prevent individuals offering them should they so wish.

Harold Owen, G2HLU, has received a request for help from W1KGH in his quest for a QSL for a contact with ZD4BT (Sid) in 1956. Anyone who can help is asked to please contact G2HLU, QTHR.

Beacons on 10MHz

KK2XJM is now active from Daytona Beach, Fla, on 10,140kHz NON (formerly A0) with 30W input. At 02, 12, 22, 32, 42 and 52min past every hour there is an identification on J3E (upper sideband). Reports would be appreciated by W4MB, R. P. Haviland, 2100 S Nova Rd, Box 45, Daytona Beach, Fla, 32019, USA.

DX news

The Clipperton DX Club (Danielle and Alain Duchauchoy—F6BFH) acts as QSL manager for the following stations: FM7AV, FG7XT, FY0EOG, FM0EVT, HH2V, J6LIW, 7X5AB, 7X5AH, TL8LI, FB8YE, TK6ITU, HU6ITU, HW3ITU, C31NB, G5DGB, HB9XJD and OE1XFD.

Several prefix changes have taken place since last month's column was written. Amateurs in Zimbabwe are now using Z2 in place of their former ZE—this merely replaces the old prefix, and the former number and suffix are being retained, ie ZE1AA would now be Z21AA. The other change concerns the island of Antigua (formerly VP2A) which now uses V2.

Copies of the summer "Newsletter and Questionnaire" of the N California DX Foundation are available free from that organization at PO Box 2368, Stanford University, California, 94305, USA. No doubt a few ircs for postage would be appreciated. The first of six NCDXF sponsored beacons now transmits a 1min message on 14,100kHz every 15min 24h daily. Its purpose is to study propagation, and its callsign is WB6ZNL. Transmissions consist of 9s dashes in 10dB power steps of 100, 10, 1, 0·1 and 0·01W. Five more stations in various parts of the world are being set up.

There now seems to be quite a lot of activity from Macao. CR9AN has been on almost daily, particularly when 28MHz is open. CR9UT has been noted on 21MHz, and OH2BH is expected to appear as CR9BH this month.

K2ROR asks that all QSL requests for contacts with FK8CE be sent direct to him, including ircs and sae. Cards sent direct airmail will be answered the same way if sufficient postage is forwarded. Alan is a stamp collector and appreciates attractive stamps on envelopes sent to his address (see "QTH Corner").

SP2BHZ/JW will remain on Svalbard until June 1982 according to *DX NL*. JX5VAA is also reported to be active between 1400 and 2000 in the 14,250-14,290kHz and 21,230-21,290kHz areas.

VP8ZR is on South Orkney and has a schedule with HI8PGG at 2000 every Sunday on 21,280kHz. VP8AJL is on the same island group and has been worked on 21,275kHz on Tuesdays at 0030 from the USA, he also keeps a schedule with his QSL manager GM4KHE on 14,275kHz at 2000. VP8AJM has also been worked on 14MHz ssb. VP8AEN is located on South Georgia and will be there until March. There is not expected to be an amateur in the relief crew when he leaves, and with the weather station becoming automatic next autumn South Georgia may be rather difficult to hear in future. The Chilean station on South Shetland, CE9AH, has been noted on 21MHz ssb around 2100, and on 28MHz a little later.

FB8WG is often to be found on 14,170 or 21,170kHz around 1600 most days. There is a "list" operation at about 1500 between 21,155 and 21,165kHz, and he has also been heard on 14,110kHz at 1900. A separate vfo and linear amplifier are being supplied to him to enable the zero-beat operations to cease.

There are now two stations on the air from Macquarie Is—VK0AN and VK0AU. The former has been heard on 14,125kHz at 1130, and it is believed that they may join the dx net on 14,220kHz.

ZL4OY/A will be on Campbell Is for most of this year. He has an IC701 with beams for 14, 21 and 28MHz, and dipoles for other bands.

6W8DY now has a 7MHz beam, and will also be operating on 3·5MHz for the benefit of those working towards 5BDXCC. Lower frequency schedules may be arranged by contact most days on 28,590kHz after 1330. J5HTL is due to close down this month, and all QSL requests should continue to go to SM3CXS.

DXpress says that VU7DA lives on the Andaman Is and will be on the air soon. UA3DDA keeps schedules with a number of Zone 23 stations in the Soviet Union at 1500 on Wednesdays and Fridays on 14,250kHz. Phil, VS6CT, says that his call is being used by a pirate on 3·5MHz—he rarely uses cw and does not operate on 3·5MHz.

Ian Miller, formerly 5H3AP, now lives in Spain. However, he has received QSL cards for contacts allegedly made in February 1981. The Tanzanian authorities have been alerted and anyone with further information is asked to contact the Tanzania Posts & Telecommunications, PO, Dar es Salaam, Tanzania.

Intruder Watch

G5XB has very kindly produced information on "mayak" jammers which reads as follows: "In recent months many dx operators have written to enquire from Intruder Watch the origin and object of the badly-distorted music transmissions which appear in various parts of the 14, 21 and 28MHz bands. In addition to broadcasting almost unintelligible music, these signals send at intervals a combination of letters or letters and figures in morse code. One such transmitter using the "signature" "7M" is a regular performer in the 28MHz band. "7M" and countless other signals of the same type are a form of jamming known familiarly as "mayak", so called because they create a wide band of jamming noise by frequency-modulating a carrier with the USSR's Mayak programme of continuous music. Incidentally, Mayak is the Russian term for "lighthouse" or "beacon". Many observers will have noticed that mayak jamming transmissions are tolerably well received when suitably de-modulated, but produce just a nasty noise when taken on a conventional a.m. or ssb receiver.

"Mayak-type jammers are to be found at various times in most of the hf broadcast bands, and all seem to produce a plentiful supply of spurious signals identifiable as harmonics—often to the fifth or sixth order—or as combination terms (sum and difference frequencies) probably resulting from a form of non-linear operation and/or co-siting of transmitters. The '7M' signal frequently reported on 28,755kHz is the fourth harmonic of a

IARU REGION 1 HF BAND PLANS

The following band plans have been discussed and agree at IARU Region 1 conferences. Although not mandatory, good operators observe them!

Band (MHz)	Type of emission	Band (MHz)	Type of emission
3·5-3·6MHz	CW (2)	18·068-18·1MHz	CW*
3·6MHz ± 20kHz	RTTY (1)	18·1-18·11MHz	CW and rtty*
3·6-3·8MHz	CW and phone (2, 3)	18·11-18·168MHz	CW and phone*
		21-21·15MHz	CW
7-7·04MHz	CW	21·1MHz ± 20kHz	RTTY (1)
7·04MHz ± 5kHz	RTTY (1)	21·15-21·45MHz	CW and phone
7·04-7·1MHz	CW and phone		
		24·89-24·92MHz	CW*
10·1-10·14MHz	CW	24·92-24·93MHz	CW and rtty*
10·14-10·15MHz	CW and rtty	24·93-24·99MHz	CW and phone*
14-14·1MHz	CW	28-28·2MHz	CW
14·09MHz ± 10kHz	RTTY	28·1MHz ± 50kHz	RTTY (1)
14·1-14·35MHz	CW and phone	28·2-29·7MHz	CW and phone
		*When available	

Notes

(1) For rtty, recommended section of operation shared with cw.
(2) 3,500-3,510kHz and 3,790-3,800kHz reserved for intercontinental working.
(3) 3,635-3,650kHz is used by USSR stations for intercontinental working.
(4) For sstv, recommended operating frequencies are: 3,735, 7,040, 14,230, 21,340, and 28,680kHz, all ± 5kHz.
(5) For beacons, 28·2-28·3MHz is recommended.
(6) For the downlink of amateur satellites, 29·4-29·55MHz is recommended.

* 10 Knightlow Road, Birmingham B17 8QB

7MHz jammer aimed at reducing the intelligibility of a broadcast on 7,190kHz. This form of interference is all too common due to the unfortunate relationship between the 7 and 9MHz broadcast bands and our own 14, 21 and 28MHz segments. QRP enthusiasts will understand that when band conditions are good a watt or so of harmonic energy will span the globe. Intruder Watch reports regular intrusions from jamming signals, but regrets that so far neither the UK administration nor the international organization has succeeded in having this pollution removed."

HF Convention 1982

This will be held at the Belfry Hotel, Milton Common, Oxford, on Saturday 19 June. More details will be published soon, but the convention will be honoured by the presence of Pat Hawker, G3VA, who will give a lecture on receiver performance, and also of Louis Varney, G5RV, a world famous authority on antennas. Louis will be giving a talk about hf antenna systems, with special reference to their use on the new hf bands.

Overseas news

Readers will be sorry to learn that Ray Naughton, VK3ATN (of "moonbounce" fame) sustained serious injuries when he fell while working on his tower. He appears to have fallen some 20ft while attempting to climb it during a severe gale.

Dave Miller, ZD8DM (also G4HJV), has reported on the activities by Ascension Is Scouts during the 24th Annual JOTA. He says that ZD8s MM, JT, DM, RH, KS, TM, DZ and NED operated two special stations, ZD8JAM and ZD8SG, over the weekend of 16-17 October, and that it was a most enjoyable event for all concerned. Special QSLs have been printed and are on their way. Equipment consisted of an FT101ZD and KW2000 with three-band vertical or 300ft long-wire antennas—the latter running from the Scout hut to the nearly extinct volcano, Sisters Peak. QSLs for ZD8JAM and ZD8SG should go to the address in "QTH Corner".

More sad news—this time of ZL1VN. Ted Trowell, G2HKU, reports making his 1,000th QSO with him on 16 October. Unfortunately this was likely to be the last as ZL1VN's health was rapidly deteriorating and he was not expected to live for many days.

G4AHM reports that during the course of his weekly schedules with 9J2TJ and 9J2KL he has learned that the Zambian authorities have issued 12 new amateur licences. This is excellent news as these are the first since 1975.

Terry Miles, G3NXR (ex-OZ1CSR), is in Tanzania for the next three years and hoping to obtain a 5H licence. Should this happen he will be looking particularly for UK contacts as soon as his FT101ZD and beam have been stoked up! QSL information will be published later.

Top band

The October *160 Meter DX Bulletin* from W1BB looks forward to the very big changes likely to affect the band as a result of WARC. USA amateurs already have exclusive and unlimited use of the 1,800 to 1,900kHz section, and many other administrations are granting new privileges—for example the Japanese now have 1,810-1,825kHz, a very big improvement. Stew reminds us that G3CWI/VP8ANT will now be on from Antartica, and likely to be heard between 1,800 and 1,807kHz. ZD8TC is on the band around 1,808-1,810kHz from 0610 to 0645 and again from 2200 to 2300 except on Sundays.

The procedure to be followed for making transatlantic or other dx contacts is set out once more, and is as follows: VE and W stations set their clocks accurately and call "CQ DX" during the first 2·5min of each 5min period. They then listen carefully for the remainder of the time. A reminder that the "DX window" (1,825-1,830kHz) should never be used by W/VE stations is also included. Finally, from the practical angle, W1BB recommends the inverted-L antenna for newcomers as being reasonably effective. This should have a length of 165 to 175ft, as much as possible being vertical, fed through a 500-800pF variable capacitor and supplied with as large an earth as possible.

Paul, K2OZ (also G5AUP) operates this fine array of equipment from his home in Park Ridge, New Jersey

Expeditions

DF3KX, DJ3NG, DJ9ON and DK9KX have received permission to visit Bouvet Is this month. Transport is available but likely to cost a very large amount of money. Callsigns will be 3Y0A and 3Y0B, should the financial problems be overcome.

The outlook for amateur radio in South Yemen in the immediate future does not apear to be good. A group of Danish amateurs was recently told by the Yemen Telecommunications Corporation that "at present we are very regret to inform you that amateur radio station in our country is still under study, and not yet established".

Latest information on the Heard Is expedition by VK9NS and others gives the chances of going ahead as about 50:50. The problem is transportation.

Guido, PA0GMM, is once again visiting the Pacific area. He will be at Majuro (Marshall Is) as KX6ZX from 14 to 18 January, at Ponape (E Caroline Is) from 19 to 25 January, Funa Futi (Tuvalu) from 27 January to 3 February, Tarawa (W Kiribati) from 4 to 10 February and then at Christmas Is (T32) (E Kiribati) until 16 February. Most callsigns are not yet known, as licences will be issued on arrival; the only problem is the KC6 licence, and if this is unobtainable Guido will operate from KC6MW or reroute to YJ8. His equipment is an FT101ZD with a 12AVQ antenna, and he will be found on ssb around 14,200, 23,300 and 28,600kHz. QSLs to his home address (see "QTH Corner").

Welcome

The Society is happy to welcome the following new members from outside the UK who joined during October: EI2W, EI5AYB, J6LT, JA3NMV, VE3OT, VK2BDG, VP5GT, VP5SL, W1NV, W0PMK, ZS6BVR and 7P8BX. Those without licences included B. M. Duncan (EA), G. Marakaia (SV9), B. Girault (F), J. M. Eradus (PA), T. Stollar (W6) and M. J. Oliv (EA6).

Contests

The HA DX Contest

2200 16 January to 2200 17 January.

CW only, restricted to 3,500-3,590, 7,000-7,035, 14,000-14,090, 21,000-21,090 and 28,000-28,090kHz. Single-operator single- and multi-band and multi-operator multi-band sections. Exchange RST and serial number (from 001). HA stations will send two letters indicating their county: BA, BE, BN, BO, BP, CS, FE, GE, HA, HE, HO, NO, PE, SA, SO, SZ, TO, VA, VE or ZA. Each QSO with HA counts five points, and with other countries outside one's own continent three. Those with one's own continent do not count. The multiplier is the sum of HA counties worked on each band (maximum 100). Separate log sheets should be submitted for each band, and a signed declaration included. Entries must be posted within six weeks of the contest to Radio Amateur League of Budapest, Budapest, PO Box 2, H-1553 Hungary.

CQ WW 160 Meter Contest

2200 29 January—1600 31 January (CW).

2200 26 February—1600 28 February (Phone).

Rules for the 1982 event had not arrived from *CQ* at the time of writing, but are assumed to be unchanged (except for the addition of a phone section). Exchanges consist of RS/T plus serial number (from 001). QSOs with own country count two points and with others five. Contacts with Canada and the USA count 10 points. The multiplier is the total of USA states, Canadian provinces, and DXCC countries worked, but please note that W and VE do not count as countries as well as states or provinces. With the increased facilities on the band available to USA amateurs, and the activity permitted from many more countries, this contest should prove to be very interesting this year. Cover sheets and log forms are available from CQ 160 Contest, 76 North Broadway, Hicksville, NY, 11801, USA. Entries for the cw event should be posted before 28 February and for the phone by 31 March.

1982 French DX Contest

0600 30 January—1800 31 January (CW).

0600 27 February—1800 28 February (Phone).

For contacts with the following countries: C3, CN, D6, DA1/2, F, FC, FB8, FG, FH, FK, FM, FO, FP, FR, FW, FY, HB, HH, J2, LX, OD, ON, TJ, TL, TN, TR, TT, TU, TY, TZ, VE2, XT, YJ, 3A, 3B, 3V, 4U (ITU), 5R, 5T, 5U, 5V, 6W, 7X, 9Q, 9U AND 9X. There are two classes: single- and multi-operator. Single-operator stations are limited to 26h of operation and the

QTH CORNER

A22DC	PO Box 1873, Gaberone, Botswana.
K8MFO/C6A W8DNC/C6A	via W8TPS, R. Schoener, 1205 Lincoln Way NW, Massillon, Ohio, 44646, USA.
FB8WG	via F2CL, Georges De Marrez, Sta Severa, 20228 Luri, Corsica, France.
FG0WA/FS7	via ON4VY, Rene Vanmeusen, Diepestreet 54, 1970 Wezembeek-Oppem, Belgium.
FK8CE	via K2ROR, A. A. Nickel, 303 Knollwood Lane, Seaford, NY, 11783, USA.
HC8MD	Box 665, Cuenca, Ecuador.
PA0GMM	G. M. van den Berg, Tweeboomlaan 117, 1624 EC Hoorn, Netherlands.
P41C	via N4RV, J. N. Reichert Jr, 11254 Oakton Rd, Oakton, Va, 22124, USA.
P41E	via K4BAI, J. T. Laney, PO Box 421, Columbus, Ga, 31902, USA.
ON4VY/PJ7	(see FG0WA/FS7).
KA2MZS/SV9	via WB5WLH, J. D. Magouirk, 315 W. Stephens-Box 755, Van Alstyne, Tx, 75095, USA.
K8ZZO/PJ7	via K8TCR, T. Wilson, 6472 Canastota Dr, Hamilton, Ohio, 45011, USA.
T5TI	via I0SSW, S. Sugoni, Via Villa Bonelli 22, Roma 00149, Italy.
VP2MBA	via W7FP, C. L. Clayton, 5270 York Hill Dr, Hood River, Ore, 97031, USA.
VP8AJL	via GM4KHE, G. M. Phanco, 1 Carleith Terrace, Dunochter, Clydebank G61 6HZ.
VP8PM	via LU3DWY, B. M. Fuentes, Poderoso 1687, 7150 Ayacucho, Buenos Aires, Argentina.
ZD8JAM ZD8SG	via ZD8AR, PO Box 4308, Patrick A. F. B., Florida, 32925, USA.
ZL4OY/A	via ZL1BQD, R. Runciman, 36 Cardiff Rd, Pakuranga, Auckland, New Zealand.
6W8DY	via VE4SK, H. F. Skaptason, 366 Whytewold Rd, Winnipeg, Man, R3J 2W5, Canada.
9Y4KG	via YASME Foundation, PO Box 2025, Castro Valley, Cal, 94546, USA.

10h off may be taken in up to three periods. Exchange RS/T and serial QSO number (from 001). French and Belgian stations will include two figures or letters to denote their location. Each QSO counts one point, and the multiplier is the total of French European departments (96), overseas departments and territories (29), DUF countries (25), Belgian provinces (9), DA2/FBA and 14 DNF countries worked on each band added together. Final score is total multipliers from all bands times total QSO points. Official log and summary sheets are available from F6BDN, REF Contest, Square Trudaine 2, 75009 Paris, France.

Results of the **1981 ARRL International DX Contests** appeared in October *QST* and are as follows:

TELEPHONY

G2QT (All band)	310,488 points	**GW4BLE** (28MHz)	385,392 points
G2FNK	272,217	G4CHP	170,445
GI3KDR	217,248	**GM4FDM**	158,523
GM3AYR	39,330	GW3NFF	128,700
G3YBH	22,200	G3WTM	123,090
G3NT	13,152	**GU3YIZ**	101,577
G4DKA (3·5MHz)	9,660	G4BEZ	100,620
G4JJE (7MHz)	324	G4KGA	79,542
GM5AXY (21MHz)	11,970	G4KIU	7,068
G5DCU	1,092	**G3IMW** (QRP 28MHz)	13,920
G4BWP (28MHz)	418,824		

CW SECTION

G4CNY (All band)	1,140,666 points	**G3SXW** (3·5MHz)	1,755 points
GM3LYY	492,525	**G3XTT** (7MHz)	29,982
G2QT	486,528	G4JJE	2,793
G3TXF	319,809	**G3PVA** (14MHz)	106,053
G3ESF	220,110	**GW3NYY**	104,445
GM3RAO	115,380	**G5CMX** (21MHz)	162,030
G3HRY	83,100	G3KKP	93,312
G3KSH	81,726	G2RO	80,496
G2FNK	59,262	**GW3NIN**	25,671
G3APN	51,480	**G4GIR** (28MHz)	210,345
G2AJB	32,064	G3WPF	176,064
G3COJ	26,715	**G4BUE** (28MHz QRP)	411,360

Awards

750 Years Diest Award

For contacts with Diest between 1 January 1980 and 31 December 1985. Belgian stations need 12 points, other Europeans six, and non-Europeans four. Each hf QSO is worth two points, and the station worked must be a member of UBA-Diest. Known members are: ON4s FB, UL, WQ; ON5s BS, FV, JH, LX, OW, QU; ON6s EU, FE, GT, KL, LS, NX, VP, MC; ON7s FH, FX, GG, HF, HQ, HZ, JQ, KS, KW, LO, NF, OO, PN, QH and QJ. Send certified log data plus five ircs to J. Cypers, ON5JH, Kapelstraat 44, B-3940 Beringen, Belgium. There will be special activity on 9 and 10 January on 14, 21 and 28MHz. Listeners may apply for the award by collecting and submitting QSLs from three members (together with log data).

Brian Watling, G3RNL, (foreground) during a visit to SVIAZ 81 in Moscow last autumn. The radio station, U81SW, could have been operated by him if he had taken a copy of his licence with him

Hampshire County Award

For contacts with Hampshire—three classes, with UK stations requiring 50, 30 and 20 points respectively, Europeans 20, 15 and 10, and others 15, 10 and 5. All must have been made since 1 October 1960, and each station worked counts one point; QSOs with G3BZU or any RNARS special station operating from Hampshire count for two points. Send log data (showing locations of stations worked) certified by a national society official that he has seen the QSLs plus 50p to G2GM, Bay Sound, Freshwater, Isle of Wight.

The WAYUR Award

G4FDC reports that the fee for this award is now 10 ircs. It is issued to those with confirmed contacts with three stations in each of the six Yugoslav republics, using at least two different bands. Starting date is 1 February 1950. Send log data, certified by an awards manager of a national society, to Awards Manager, SRJ, Box 48, 11001 Belgrade, Yugoslavia.

Around the bands

The G8KG report for the past month reads as follows: "November got off to a good start, with a combination of high solar flux and low geomagnetic activity during the first five days producing some excellent conditions on the higher hf bands and on 50MHz. In the following three weeks, however, the flux fell steadily from 270 to 154 sfu and the geomagnetic field was unsettled or active on most days, giving the rather variable conditions which are to be expected at this stage of the cycle.

"It is now clear that the period from late July to early November was, in terms of solar flux, the most active of the cycle. By 25 November the 27-day average had been above 200 sfu for 115 days (in last month's report '96 days' should have read '83 days'). Putting this another way, the monthly mean for November will probably be about 205 sfu, in which case there will, for the first time in the cycle, have been four consecutive months with a monthly mean above 200 sfu.

"It is too early to be certain that this spell is now over. At the time of writing, the flux was again rising but was running at about 25 units lower than in the previous solar rotation, which suggests that the underlying trend is now downwards".

Thanks to the following for logs supplied from which this part of the column has been compiled: G3YY, G5JL, G3s, GIQ, GVV, IMW, KSH, NWG, XBY, G4s BUO, BYG, EHQ, JVG, GW4KGR and G4LRS.

Stations listed in italics were using A1A (the new designation for A1), the rest J3E (formerly A3j).

1·8MHz. **1600** *OH0NA.* **2100** *UA9, UB5, UP,* VK6HD. **2200** *KP4KK/DU2, VS6DO,* **2300** *UA9SAX.*

3·5MHz. **0100** *CT2DV,* R5I (=UB5), TF3YH. **0200** EA9IE. **0600** *KL7U, G3KTR/5N9.* **0700** *CN8AD, EA8AJ,* NA6T, UK1PGO, W0MJ, XE1AE, 9Y4KG. **0800** ZL4s AP, KF. **2100** UK9AAN, UA0QEZ. **2200** UK0AMM. **2300** UH8YAG.

7MHz. **0500** *KH6JW, DJ5CQ/3A,* 7X4MD. **0700** N6KT/HK0, VP2s KAE, MBA, VD, *W1-W6* and *W8-W0, ZL2AWW,* 8P6OR. **0800** *UK1PGO.* **1900** *VK3MR.* **2300** *HL9RH, PY, UA0WBC, UL7PBE.*

14MHz. **0000** JX5VAA, KC7I/TN8, VP8MT, VU2VPR. **0100** 3X1Z. **0400** J6LIR, TR8DX. **0700** FO8EA, KL7, VK9NS. **0900** JW6MY, KH6, VK, W6, ZL, ZL4PO/C. **1000** KH6FKG. **1100** W7. **1500** VS6s CF, EY. **1600** KC6IN, 3B8DO/3B7. **1700** 9M2AV. **1900** UA1PAM. **2000** KX6QX, VP2MH, G3AAE/VP9. **2100** HF0POL, J3AH, VP5RAC. **2200** DU6JM, JY5US, UK1PGO, VE3GAM/V2A. **2300** SV0BV/SV5.

21MHz. **0000** J5HTL. **0700** FO8EW, VKs. **0800** JAs, KL7s, VKs, ZLs. **0900** JT0YFU, KL7FI, TJ1GH, ZL4PO/C. **1000** KL7PX, **1200** P2NJL. **1300** VK, VP2VHT. **1400** 4U1UN. **1500** VK9YC. **1600** FB8WG, S21GM, 9Y4KG. **1800** FR7AI/J, WB5SNA/HR1, W6-W7s (until 2000), 9U5WR. **1900** FR0FLO, KH6IJ, VP8ANT. **2000** HF0POL, VE3GAM/V2A, VP8ZR, XT2AW, 7Q7LW. **2200** HH2JR. **2300** HL9FR.

28MHz. **0600** KH6DQ. **0800** JA. **0900** JAs, VK9NG, YJ8RW. **1000** JD1BAE, KB7IJ/KH2, KG6JDX, UA9FEB/U9G, VS6CT. **1100** AP2P, C5AEH, J28DL, UK1PGO. **1200** JD1AGV, OY5NS, VP5GC, VP9AD, ZB2GZ. **1300** CE0AE, HC8MD, VK9YC, 4K1A. **1400** HZ1AB, UK9OBC/U8U, VK9NYG. **1500** Z21GL, G3LJF/3B8. **1600** W6-W7, 9Y4KG. **1700** AH6A, P41C, W6-W7s (until 2000), ZL2GH. **1800** CE0, FG7AR/FS7, J5HTL, ZF2FU. **1900** KL7PS.

Acknowledgements to the following for information: *DX NL* **(DL3RK),** *Lynx DX Bulletin* **(EA1QF/EA2JG),** the *DX Bulletin* **(K1TN),** the *Long Island DX Bulletin* **(W4UL/W2IYX),** *DX News Sheet* **(Geoff Watts),** the *Ex-G Radio Club Bulletin* **(W3HQO),** *Long Skip* **(VE3EUP),** *DX'press* **(PA0TO)** and *CQ Magazine* **(W1WY).**

Please send all items for the **March** issue to reach G3FKM no later than **29 January**, and for the **April** issue by **5 March.** It is always a great disappointment when news items arrive one or two days after these deadlines—even one day after is **too late**, as *MOTA* is completed on a very tight schedule indeed!

SWL NEWS

Bob Treacher, BRS32525*

DX swl

We are happy to welcome again Stan Porter, ORS45992, who wrote from Mzimba, Malawi; he was pleased that several members had taken the trouble to drop him a line as a result of his appearance in this column early in 1981. He boasts an 80 per cent success rate on QSL cards sent so far—perhaps being exotic dx helps. He is interested in trying to form a club and perhaps producing a quarterly newsletter, but his problem is finding other swls or licensed amateurs in 7Q7 when he is 256 miles from town! He said that 7 and 3·5MHz provide little in the way of dx outside of Africa. Stan wonders whether any reader can help him with spares for a CR100/2 receiver; his address is PO Box 1, Mbalanda, Mzimba, Malawi.

David Hill, RS42153, lives in Sindelfingen, West Germany. He passed on information regarding a 28MHz beacon, DF0AAB, which has been relocated 163m above sea level in QTH locator FO53g, near Kiel, and transmits using 15W into a groundplane antenna. DL6TW is the beacon keeper and he is especially interested to receive reception reports from swls. David also mentions DB0TX on 145·650MHz (R2) located in EK63h, and is sited 880m up the "Feldberg" mountain near Frankfurt. He heard some G stations through it during the summer tropospheric conditions, and he also remarked that he heard stations using the repeater from HB9 and OE at the same time. For those interested in monitoring 28MHz conditions, the front cover of *Rad Com* September 1981 has an easy-to-read map showing the 28MHz beacons.

DX news

GM4ELV mentioned that UA1PAL QSL cards are only valid for DXCC if sent via UA1OSM. He added that his QSL return as an swl was 3,729 cards out and 3,610 in, giving a very high percentage of 96.

Stan Porter also advised that the QSL address for 7Q7LW given recently in "QTH Corner" was slightly incorrect. The correct address for a fb QSL card depicting a Gulenamkulu dancer is Les Sampson, PO Box 24, Mtakataka, Malawi.

News from GW and GM

No less than five letters from outside G this time, including several new contributors. One new boy is 11-year-old Ean Davies, RS47570, whose grandfather, GW4KGI, bought him an FR50b. He has so far heard some interesting dx on both 28 and 21MHz; 28MHz provided KP4EQF, VK3OM, VP8AGY and 7Q7LW, while on 21MHz Ean copied DU7RLC, H44WF and some JAs. Ean's best dx QSL to date is from VS6CT.

Rhys Thomas, ARS45717, took the December RAE and was hoping to purchase a 28–144MHz converter with the proceeds from the sale of a ZX81 computer. He had been monitoring the lower edges of the bands and logged KP4BZ, TG9EW, ZM7KD, 5N6ATT and 9Y4SL. Conditions could not have been too good on the night he wrote, as his closing remark referred to "going QRT to watch Paul Daniels on television"!

Graham Powell, RS46228, commented on a loaned National Panasonic DR26 receiver which does not cover 21 or 28MHz. Fortunately, another receiver is available and he missed little during CQWW. He has now heard 221 countries, but had only three confirmed at the time he wrote—G, VP8 (Antarctica) and VP8 (South Georgia). Commenting on the new bands, Graham wondered whether the 10MHz band would feature in the tables from now on. As very few countries will have use of the band, the answer at the moment is "No", but we can review the situation at a later date.

Anne Edmondson, BRS47285, lives in Edinburgh and her spare time is occupied with studying for the RAE and driving her flatmate crazy with a Datong D70 morse tutor! She is a member of BYLARA, RNARS, the Edinburgh & DARC and the Lothian ARS. She uses a DX200, with a long wire around the picture rail, but hopes to build an atu and put up a better antenna system. Anne monitors all bands and is hoping to invest in some multi-coloured QSL cards in the near future. She mentioned the set listening periods of a few years ago organized by Dave Whitaker, BRS25429, and wondered whether there were any plans to resurrect them (Over to you, Dave!).

Kathy Kantyrowicz, BRS48445, comments on a /M journey from GM to Somerset and on to Norfolk which was enhanced by the presence of a 144MHz fm receiver. At home, Kathy uses an Eddystone 680X and a 60ft wire. She also expressed interest in obtaining her own design QSL cards, and had read with interest the recent views in this column on QSL card design. Views vary significantly, but the one important thing to remember is that the actual report *must* be accurate and informative. The decorative side of QSL cards is obviously an added extra which might make all the difference in a "borderline" case.

1981 HF COUNTRIES TABLE

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS14585	213	226	229	160	132	29	989	ssb/cw
RS42604	202	213	206	158	118	29	926	ssb
BRS25429	197	216	222	138	112	33	918	ssb
BRS8841	194	212	238	132	104	16	896	ssb/cw
BRS48909	189	221	223	121	75	23	852	ssb
BRS44703	156	162	180	117	100	26	741	ssb
A8808	172	166	164	106	96	34	738	ssb/cw
BRS1066	146	171	168	85	66	42	678	ssb/cw
RS46228	84	129	167	147	63	23	613	ssb/cw
BRS44266	134	106	151	56	41	13	501	ssb
BRS18529	75	103	128	79	76	25	483	ssb
BRS35509	91	131	145	62	45	2	476	ssb
ORS45992/7Q7	134	173	143	4	12	0	466	ssb
BRS31440	120	122	100	65	42	3	452	ssb
ARS42503	92	125	146	28	32	0	422	ssb
A9191	88	100	117	49	40	8	402	ssb/cw
BRS41992	56	74	131	65	50	16	392	ssb
RS44218	81	85	111	26	21	5	329	ssb/cw
BRS40705	95	85	92	31	24	1	327	ssb
BRS46708	71	40	85	40	57	0	293	ssb
ARS41349	44	73	51	25	34	2	229	ssb

CQWW

As so many reporters this time have remarked on the good band conditions at the end of October, your scribe will devote a few lines to some comments on CQWW. As usual a number of dxpeditions were mounted, mainly in the Caribbean area. They included activity from VP2E, VP2K, VP2M, VP2V and PJ, plus special activity from XE, VO2, 8P6 and 9Y4. 4U36UN was also active from the UN Building in New York, and was mentioned as heard on 7,195kHz at 0800 on the Saturday of the contest. Europe was well catered for with LX, HB0 and OH0 expeditions prominent. Other interesting loggings mentioned were: **28MHz**—HM1PW, OA1BU, SV0BV/SV5; **21MHz**—FP0GAQ, N6KT/HK0, JT0YFU, YB0AEA and ZK2ZZ; **14MHz**—KG6RE, VP5IW; **7MHz**—K6HNZ/CT3, HZ1AB, KL7G, UF6DZ, VS6DO and 8P6T; while on **3·5MHz** KH6XX was the highlight of those stations mentioned.

1·8MHz

There were also plenty of reports on the **1·8MHz** band. Peter Norris, BRS47513, mentioned EI8H, EA3VY and W2HCW. Brad Bradbury, BRS1066, logged EA1, EA6, HB9 and YU. EA6CE, EA9EU and GD4BEG were prize loggings of Robert Small, BRS8841. Brian Wainwright, BRS44703, heard EA9EU, LZ1KDP, UP2BEW and 4X4NJ. Harold Moss, BRS18529, added several Russian republics to his all-time list, but wondered why so many UAs seemed content just to chat to themselves when the band was wide open for European working? Graham Powell, RS46228, heard 22 countries during CQWW. Apart from those mentioned above he lists UA3, UB5, UQ2, OH0BH and EA8AK. David Hawes, A 9191, heard 4X4NJ as his best-ever dx on the band. Other countries on the band during CQWW included HB0, OE, OK, SP, UR2, UF6 and 4U1ITU.

Here and there

G4LDS takes up a point made in this column in November regarding swls getting to know a nearby amateur with an up-to-date *Call Book*. G4LDS would be delighted to help any swl who needs dx addresses. Just an sae to 65 Crompton Street, Chelmsford, Essex CM1 3BW, will bring the desired results. He also QSLs all correct listener reports 100 per cent and can be found mainly on 28MHz.

QSL returns from various sources this month—WB0IOS/KH7, AH8A, VE1BL/1 (St Paul Is), V3ABEH, VK9YC, YJ8RG, TI9FAG, WB2REM/HC8, SV0BV/5, FO8DF, 9V1UH, N4FKZ/HR5 and 9Q5FL.

To close, there is a rumour of a possible trip to ZA by some EA operators. We can always hope!

Copy for the **March** issue should reach your scribe by **Tuesday 19 January**, remembering to update those table scores. Also a gentle reminder about the lower frequency band challenge posed in *SWL news*, December —there will be a small prize this year—and remember too the White Rose Lower Frequency Band Contest. □

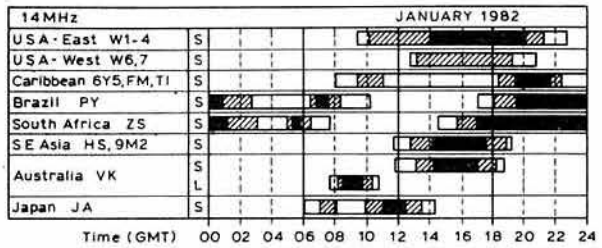
* 79 Granby Road, Eltham, London SE9 1EH

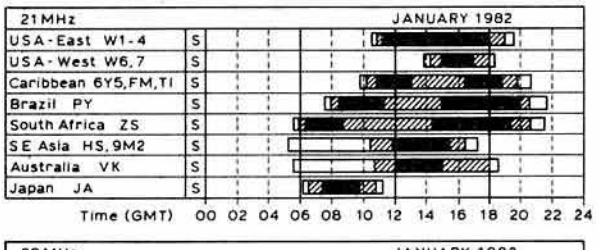
Propagation predictions

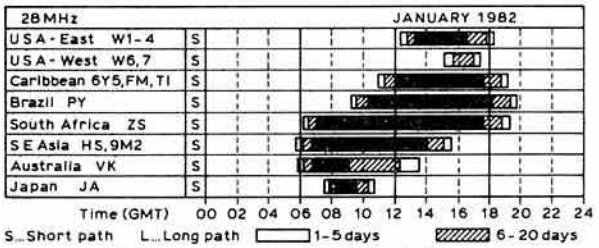
Conditions during January will differ little from those of the previous month. Towards the end of the month the hf bands will remain open a little longer. Predictions given for December will also prevail during January.

It is pointed out again that the graphs for 28, 21 and 14MHz use the gmt time-scale; this makes it easier to convert into local time in the various dx regions.

The provisional mean sunspot number for October 1981 from the Sunspot Index Data Centre was 161·2. The maximum daily number was 223 on 16 October, and the minimum was 63 on 27 October. The predicted smoothed numbers for January, February and March are 124, 122 and 120 respectively.







HF propagation study

Band predictions for January 1982

	28MHz	21MHz	14MHz	10MHz	7MHz	3·5MHz
UTC	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802
EUROPE						
Moscow	....49982...	....89997...	...1877884..	11.565557821	762532235776	++42....25++
Malta	....48764...	....999982..	....8777993.	33.554457984	884631125898	+++3....25++
Gibraltar	.....6543...	.....499883..	....8877893.	11..75556893	774253224798	+++2....4++
Iceland	.....1562...	.....69981..	....188897..	....6666783.	464.64345785	+++3...24++
ASIA						
Osaka	....3.....	....84.....	...1751..1.1	1..153124614	....2..13663	.....35.
Hong Kong	....884....	....18883....	....355542..	2...12235751	1.....3685	353
Bangkok	....8++92...	....158888...	.....54685..	3....2135856	2.....3688	355
Singapore	....78883...	....258888...	5457511	2....2125865	1.....2686	353
New Delhi	....8984....	....357882...	....1.2467.11	52....135566	72.....2678	5.....355
Teheran	....1+++93...	....666888...	2..511457721	7432..125887	872.....2677	54.....344
Colombo	....1+++94...	....2358881..	1.....457821	62....125887	51.....2678	2.....345
Bahrain	....1++884...	....6557882..	31.3..357852	8631...25888	972.....2677	54.....344
Cyprus	....9+996....	....2888993..	1..765578941	762532246897	8862...13788	++3.....4+5
Aden	....1++8971..	....53368961.	53.2..157985	983....25888	872.....2676	54.....344
OCEANIA						
Suva (S)	.....2651...	.....7886....	....565675..	....1532354..	....131..22..	.....
Suva (L)	....4331.131	1...87654652	...27534771.	....352.144..	.....2....11..	.....
Wellington (S)	.....565....	.....48885...	.....765673..	.....1532353..	.....2...121..	.....
Wellington (L)	....221....11	1...76521342	....7534662.	....1521143..	.....2....11..	.....
Sydney (S)	....75672....	....188887...	.....655683..	.....3223572.	.....351.	.....2..
Sydney (L)	.....1.....	....2642.142	65445751	....3212462.	.....1....14..	.....
Perth	...176544....	...2588881...	5457721	2125873	2662	.....33.
Honolulu	.....	.....4..	.22.1.1.161.	.152512143..	..3631..21..	....4.....
AFRICA						
Seychelles	....1446631..	...32368862.	53....157986	951,...25888	83.....2677	5.....344
Mauritius	....1478772..	...22358973.	63.....57997	84.....25899	72.....2688	4.....355
Nairobi	....17678731.	1..433479862	8612...37998	983.....5898	872.....2677	54.....354
Salisbury	....4567752.	21.233369984	9712...16999	983.....3899	862.....1688	54.....355
Capetown	44778741	32.132348996	9822....3799	984.....1589	862.....278	54.....4+
Lagos	....9+889741	42..84348997	99353...4899	89851...1699	7883.....378	455.....55
Ascension Is	68656631	32..85335886	98416....599	89953....279	7885.....58	45+2.....2+
Dakar	....5++88831	21..87436986	885.72..1699	88944....379	77862....158	44+4.....2+
Las Palmas	....299885..	....7988994.	221.86556897	887163223689	889641..1479	+5+5.....4+
S AMERICA						
South Shetland	24455431	21..78655565	664.652...25	455342.....2	12321.....	.....
Falkland Is	....2557873.	1...78533464	775.741...15	688351.....2	36652.....	.332.....
Rio de Janeiro	.....653453.	1...47432474	865.73....58	999351....26	87862.....3	55+4.....
Buenos Aires	....1354673.	67532254	665.75....16	789352.....3	57862.....1	25+4.....
Lima	.....++872.	11853332	434.654....4	6882521....2	47863.....	.554.....
Bogota	.....++872.	853341	324..44...16	7882331.....3	67763.....1	3544.....
N AMERICA						
Barbados	.....2++872.	7843562	434...54...47	8882321....16	87663.....3	5444.....
Jamaica	.....8++71.	864341	324.1341..16	7882431....3	67763.....1	3544.....
Bermuda	.....8++71.	3875661	324..542.157	8883431...26	87763.....4	5544.....
New York	.....6++71.	.....88775.	334..4452256	88834312..26	77773.....3	4444.....
Mexico	.....9+6..	.....8632.	234.21351..2	48835212....	27863.....	.453.....
Montreal	.....5++7..	.....88884.	334..5553466	888343221136	77773.....14	4444.....
Denver	.....185..	.....6872.	344.1..55223	588342122..2	368731.....	.454.....
Los Angeles	.....64..	.....861.	234.11.46211	378342.23...	158631.....	.254.....
Vancouver	.....12..	.....671.	244.12.27642	478343125322	257631..2...	.244.....
Fairbanks	.....	.....12..	242.24346832	467253235654	235631..2422	..24.....

Note. The times (UTC) under each band are read vertically, starting 00 and ending 22 (hours gmt).

YOUR OPINION

OPERATING ON 144MHz

The Editor
Radio Communication

Sir—May I congratulate G4FQI and G8CXV (*Rad Com* September 1981) for being the first to tell the truth about 144MHz repeaters.

Having spent many hours listening to repeaters from the many high /M and /P sites in mid-Wales, I have reached the following conclusions: (1) They are useful propagation indicators, and (2) they are little better than cb. Let us by all means close down the 144MHz repeaters. We have proved they are technically feasible, but enough is enough. Those G8s and G6s who so desire can purchase cb rigs and leave the frequencies clean for radio "amateurs" in the true sense of the word.

And finally, why not try abandoning the use of simplex channels altogether. By all means have one or two calling channels, but let us have an end to S16, S17 etc. We can produce stable vfos or comparable synthesized rigs now.

All things have their end, and the time for repeaters to die is overdue. By the way, despite my callsign and opinions, I am still under 30.

Cliff Lewis, GW3YTL

WANTED—A NO FRILLS CW TRANSCEIVER

The Editor
Radio Communication

Sir—I am writing to express my support for Jack Maling, G5JL, and his plea for a no-frills, optimized cw transceiver (*77* September 1981). I have badgered dealers for some time about this, and at one point wrote to Yaesu in Japan to see if it would provoke a response. It did, they recommended an FT901, one of the worst rigs for gimmicks available. The only thing in its favour was the possibility of a built-in cw keyer; however, this is an option!

I hope one of the manufacturers reads *Rad Com*, as I am sure there must be a demand for a rig of this type, and hopefully all the cw operators will let them know it.

Tim Winter, G4AOK

PLAIN SPEAKING

The Editor
Radio Communication

Sir—Why can't radio amateurs talk English? Is it really necessary to talk entirely in Q-code and jargon?

Q-codes are perfectly acceptable when working someone who does not understand English very well, or when conditions are bad, even though they are meant for cw working. They are pointless on 144MHz fm talking to locals, and if anybody starts up a "talk English" channel, I'll be there. I have heard various comments about hf and cw and the "rubber stamp" contacts that take place, but surely that is very similar to the beginning and end of local fm contacts. How many times have you heard ". . . so, this is G . . . signing off and clear with G . . ., wishing that station best of 73s after a very enjoyable QSO. This station will briefly monitor this channel; if not called will go QRT."? Why not say "Goodbye, this is G . . ."?

It is amazing how many new G6s get completely tongue-tied trying to remember all the abbreviations and codes in their first few days of operation because they think they have got to use them. It would seem that amateur radio is becoming more like cb; in fact there is a growing trend on 27MHz not to use their 10 codes but to talk English. Shouldn't we look at our operating procedures and ask ourselves if it is all really necessary.

I would very much like to see further letters on this matter, and before anyone comments on the relatively new callsign, or the fact that I was a G6, I will point out that I have been interested in amateur radio for at least seven years, and think that is long enough to form an opinion.

P. White, G4MBY

DEMETRICATION

The Editor
Radio Communication

Sir—I read with interest G6ZC's letter regarding the use of frequency and wavelength in describing bands. I, too, believe that wavelength is a hangover from past ages and should be abolished forthwith. Every time I see a new Yaesu model, I despair at the perpetuation of inconsistent markings: frequency on some controls, wavebands on others.

On the domestic receiver scene the change is slowly taking place. The BBC, through the British Radio & Electrical Manufacturers' Association (BREMA), requested four years ago that all domestic radio receivers should be marked in frequency alone. About the same time, station identification announcements were changed from wavelength only to frequency-plus-wavelength in preparation for the change to frequency-only announcements. Some months ago Radio 2 dropped wavelength identification altogether in preference for frequency, and in the near future the remaining services will follow suit. *Radio Times* shows frequencies in bold type and wavelength in normal type face.

Whatever unit is used by the general public makes no difference. They only deal in numbers and will grasp anything given a year or two. I say, give them frequency alone and then we can all, amateurs and public alike, forget that wavelength ever existed.

With due respect to the pioneers of physics.

Keith Orchard, G3TTC

CB

The Editor
Radio Communication

Sir—Quite understandably there is considerable concern about cb among radio amateurs, many of whom see cb as a threat to the unimpeded enjoyment of their hobby. But there seems to be much confusion as to what, if anything, we should do about it. As someone who has seen cb in operation in several other countries, may I offer some comments and suggestions as to our future approach to the subject.

CB is here to stay. The social case (I hesitate to use the word "need") won the political day in the face of considerable and well informed opposition—particularly to the 27MHz allocation. Whatever one's feelings as a radio amateur, there is little doubt that cb will bring much enjoyment to many, particularly the young and the lonely, who merely want a method of quick and easy social contact with like-minded individuals for a comparatively modest cash outlay when compared with other, more conventional methods of social activity. It is easy to belittle cb, but I submit that to do so is the easiest way that we radio amateurs can lose our credibility and respect in the eyes of both government and public. While I do not advocate any blurring of the substantial and irreconcilable differences between cb and amateur radio, I do feel that we should now take a positive attitude, not only to protect our interests in the immediate future, but also to come to a workable accommodation with cb in the longer term.

There are justifiable fears that radio amateurs will be blamed for, or at least implicated in, the excesses of the less responsible element of the cb fraternity, and that this will extend to the unjustified restriction or harassment by neighbours and/or local authorities. Particular concern is regularly voiced over infringement of the 28MHz band. The nub of the problem must lie in the proper regulation of the cb licensing conditions. Despite the Society's sensible policy for the future (*Rad Com*, 19 September 1981, pp805-6), I believe that a major regulation effort will be required if cb licensing conditions are to be observed to any significant degree. Official regulation and enforcement costs money, but resources are scarce at present, and likely to get scarcer still.

So, what is to be done? I feel that the Society's future policy on cb is the right one—so far as it goes. But I believe that we need to take a more robust and specific approach if we are to protect our interests adequately. To this end I suggest that:

1. The Society should develop links with the cb fraternity, and with any future national organization representing cb enthusiasts, with the aim of encouraging self-regulation and of promoting an awareness of what amateur radio has to offer as a logical progression of interest.
2. Members should be encouraged by the Society to use the 28MHz band, on the basis of "use it or lose it", perhaps by the sponsorship of regular competitions.
3. The valuable Intruder Watch service should be asked to give particular attention to the 28MHz band. The scale of infringements by cb stations should be published each month in *Rad Com* in order that members are regularly reminded of the situation.
4. The Association of Chief Police Officers should be approached by the Society and made aware of the essential differences between cb and amateur radio. The Society should emphasize its concern at the number and manner of reported incidents involving difficulties encountered by radio amateurs in establishing their bona fides, particularly with police officers.
5. The Society should press the Home Office to issue the amateur licence as an easily recognizable, durable and authoritative official document, which can be carried in the pocket. (The German licence is an excellent example; the bulk of the licensing conditions being relegated to a separate booklet). The amateur licence should take a different form to that provided for the cb service.
6. The Home Office should be pressed by the Society to ban the import or manufacture of transmitting equipment which does not meet the type-approved specification for the cb service.
7. The Society should report to the Home Office, and other proper authorities, persistent or flagrant contravention of cb licensing conditions which may come to its notice, particularly when such instances adversely affect the interests of its members.

M. G. Taylor, G3UCT
(Ex-DL2AY, DA2XT, DA2QU and VP1MT)

OBITUARY

The Society records with regret the deaths of the following radio amateurs:

Wing Commander C. H. Parsons, RAFVR, GW8NP

Former RSGB President Cyril Parsons, who died on 16 November, had an interest in radio from an early age. In 1921 he constructed his first valve (3) receiver, and in 1926 obtained an artificial antenna licence with the callsign 2BPN. During the second world war, as a member of the RAFVR, he rose to the rank of wing commander, and during the North African campaign he investigated radar valve problems.

Cyril was always a strong supporter of the RSGB, and was Region 10 representative for many years until his election as zonal Council member for Wales in 1971. In 1975 he was elected President of the Society; the first GW to hold this office, and the first President to be installed outside London—in Cardiff Castle. He was chairman of the Membership & Representation Committee for several years, and chairman of the Finance & Staff Committee in 1976 when the decision to install a data processor was made. He retired from Council in 1979, and in the same year was awarded the Founders Trophy for services to the Society.

During the IYDP, 1981, Cyril organized a permanent amateur station at the Highfield Centre for the Disabled in Cardiff with the callsign GW4LFO, and together with others he instigated RAE courses at the centre.

His services to the Society will long be remembered.

Mr E. J. Allan, GM5NW
One of the "fathers" of amateur radio, Ernie Allan died on 22 September 1981. In 1919, when he was 16 years old, his father obtained a licence to operate "apparatus for the reception of wireless signals (including the use of thermionic valves)", and Ernie was permitted to operate the station as his agent. Transmitting was soon to follow, and the first callsign, EJA, was changed to 5NW when he received a transmitting licence. With the advent of broadcasting, Ernie founded E. J. Allan & Co, to serve the needs of the Dundee area.

He served in the Radio Security Service during the second world war, and afterwards when amateur licences were restored, he became well known worldwide with the aid of a large hf a.m. rig with a three-band quad 40ft high, and a 136ft dipole on two 66ft masts.

Mr P. Barowitz, G3LZW
Peter Barowitz died on 19 October 1981, aged 38. Licensed in 1958, he left his native Shipley in the 'sixties to take up an electronics design post in Hertfordshire, where he became an active member of the then Mid-Herts RSGB Group.

Mr T. J. Brooke, GW3GHC
Joe Brooke died on 16 October 1981 in his early fifties. He was a native of Stourbridge, where he was first licensed after serving as a commissioned officer in the Royal Corps of Signals.

He and his family moved to Cardiff in 1956 where he became an active member of the Cardiff RSGB Group. He was its chairman for many years until his death and coupled that office with that of RSGB Area Representative. Joe was active on all bands both hf and vhf, and was a keen dxer and contest operator on both cw and ssb. He will be remembered with affection in south Wales and in Cardiff in particular for his keenness, enthusiasm and a willingness at all times to devote time and patience to the activities of the RSGB and the Cardiff Group.

Heddwch annwyl gyfaill.

Mr L. Coupland, G2BQC
Les Coupland died early in November 1981. An outstanding cw operator, he held many dx awards. As a member of the RAF Civilian Wireless Reserve, "The Early Birds", he landed in France at the outbreak of the second world war.

Mr C. Callanan, GM3HLQ
Charlie Callanan died on 15 September 1981, aged 77. He had been an active chairman of the Sunday morning 3·5MHz "Scots Corner" net for over 30 years. In his time he helped many amateurs over the cw hurdle.

R. L. Dale, G2DDR
Len Dale died on 23 October 1981, aged 90. He had been active as a listener since 1917. He was one of the founder members of the Cornish Radio Club in 1937. After the second world war his voice was well known as a regular member of the Rotary Net, and he was active on 70 and 144MHz.

Mr E. J. Daly, G4AKM
Eric Joseph Daly died on 3 September 1981. He was a civilian instructional officer at the Signal Wing, Royal School of Military Engineering, Chattenden Barracks, Rochester, Kent, and operated G3XRE, an RSARS Royal Engineers club station, from there.

Mr E. W. Freeman, G3HYU
Ernie Freeman died on 5 November 1981, aged 67. He was very well known for his 3·5MHz activities from Solihull, and had been active on the bands until his death.

Mr D. E. Herbert, G6RF
Derek Herbert died on 13 November 1981. Latterly, he was active only on 144MHz, but his callsign was doubtless known to many throughout the country.

Mr L. Lawler, G3SYT
Les Lawler, who died on 19 August 1981, had already been a member of the Society for many years when he was licensed in 1963. He spent more time with the soldering iron than with mike or key and his commonsense approach to technical problems will be missed by his friends at the Clifton Amateur Radio Society. He was also a member of the Royal Signals ARS.

Mr F. B. Le Cocq, GJ4JVO
Mr Le Cocq died on 4 November 1981. He had been RSGB Area Representative for Jersey until June of that year. He had also been chairman of the Jersey ARS for the last four years, and a member of RAFARS. He was well known on the hf bands.

Mr F. W. Miles, G5ML
Freddie Miles died early in November 1981 at the age of 79. Although inactive in later life, he was a world-wide figure in the field, being one of a few stations licensed to use 500W in the 'thirties. His record of "worked all continents" on telephony in just over three minutes probably stands to this day. He was a past-president of Coventry Amateur Radio Society and RSGB Area Representative for Warwickshire.

Mr P. J. Reynolds, G3PQR
Phil Reynolds died on 20 August 1981, aged 38. He was a keen and active amateur, specializing in microwave frequencies and the use of all solidstate equipment. He made what is thought to be the first two-way QSO between G and PA0 on 432MHz using this equipment.

Mr G. B. Saunders, G8BOS
George Saunders died on 5 July1981, aged 74. He had been an active member of the Essex Raynet Group for some time and in spite of failing health for the past four years had regularly called in on their weekly nets, sometimes from his bed using his handheld.

Mr G. Springer, G3FQS
Gerald Springer died on 20 July 1981, aged 80. He was active on 144MHz from the old peoples home where he lived, using equipment rigged-up by some of his amateur radio friends.

Mr G. Wilby, G2BSU
George Wilby, a recent secretary of North Bristol Amateur Radio Club, died on 25 February 1981. He joined the RSGB in November 1934 as BRS1649, was a member of the Civilian Wireless Reserve, and was later drafted to Africa with the RAF at the outbreak of the second world war. He was an ardent supporter of local events and a member of RAFARS, and was active on 1·8 and 144MHz up to a day or two before he died.

Also:

Mr W. R. Goodman, G8DHK;
Mr B. J. Harding, G8WXZ;
Mr Jolly, RS45427;
Mr J. Melvin, GM3NSQ, on 21 March 1981;
Mr. F. Reeman, RS47733;
Mr W. S. Robson, RS17056;
Mr J. Sugden, GW3SLA, on 17 December 1980.

CONTEST NEWS

General rules for RSGB hf contests 1982

The general rules for all RSGB hf contests are given below. For each contest throughout the year a specific set of rules will be published which must be read in conjunction with the general rules.

1. Entrants must operate in accordance with the terms of their licences.
2. Only one contact on each band may be claimed with a specific station, whether fixed, portable, mobile or alternative address. Duplicate contacts must be logged and clearly marked as duplicates without claim for points. Proof of contact may be required.
3. Unless otherwise stated, only single-operator entries will be accepted. A single-operator station is one manned by an individual operator who receives no assistance whatsoever during the contest period.
4. When multi-operator entries are specifically allowed, such entries will be accepted only if:
(a) The declaration is signed by one operator, who will be regarded as the entrant, and
(b) the operator's callsign is given for each contact.
5. Operators of stations located within the British Isles, ie within the call areas G, GD, GI, GJ, GM, GU and GW, must be fully paid-up members of the RSGB.
6. A contact consists of an exchange and an acknowledgement of an RS report on telephony or of an RST report on telegraphy, and a three-figure serial number commencing with 001 and increasing by one for each successive contact throughout the contest period, irrespective of the band or mode in use. Serial numbers, when sent, must be recorded from non-competing stations.
7. Entries must be clearly written or typed on one side only of RSGB hf contest log sheets (Form HFC1) or international A4 size paper using blue or black ink. *Separate log sheets must be used for each band.* Logs must be kept and entries submitted in gmt.
8. Each entry must include a cover/summary sheet (eg Form HFC2) incorporating a signed declaration.
9. Entries must be addressed to the adjudicator, whose address will appear in the specific rules for each contest, with the name of the contest marked in the top left-hand corner. All entries must be postmarked not later than 15 days following the contest. If acknowledgement of receipt is required, British Isles entrants should include a stamped addressed postcard which will be returned to the sender. Overseas entries will not normally be acknowledged.
10. All entries become the property of the RSGB. In the event of any dispute, the ruling of the Council of the RSGB shall be final.
11. For scoring purposes, aeronautical mobile and maritime mobile stations will count only as the minimum score of the particular contest and not for any bonus or multiplier. Entries from GB stations, aeronautical mobile and maritime mobile stations will not be accepted.
12. Awards are made at the discretion of the Council of the RSGB and may consist of trophies, plaques or certificates. When possible, awards are presented at the RSGB AGM following the contest.
13. Certificates of merit are normally sent to the three leading stations in each section of a contest.
14. Entrants may be disqualified for failure to observe the general rules or the specific rules.
15. Points are deducted for errors in the logs. For unmarked duplicate contacts for which points have been claimed, additional penalty points may be deducted (eg five times the claimed score for the contact).
16. Small quantities of RSGB hf contest log sheets (Form HFC1) and cover/summary sheets (Form HFC2) may be obtained from RSGB HQ on receipt of a large stamped addressed envelope. Larger quantities may be purchased.

General rules for RSGB hf receiving contests 1982

1. To claim points, a station may be logged once only on each band whether fixed, portable, mobile, or alternative address.
2. A receiving station log must show in columns: date/time (gmt), callsign of station heard, report and serial number sent by station heard, callsign of station being worked, bonus points, total points. The band in use must be shown at the top of each log sheet.
3. A cover/summary sheet (eg Form HFC2) must be submitted with the logs. The signed declaration must include the words "I certify that I do not hold a transmitting licence".
4. The following rules from the transmitting general rules also apply to receiving contests: 3,5,7,9,11,12,13,14,15 and 16.

General rules for vhf/uhf/shf contests 1982

The rules governing all RSGB vhf/uhf/shf contests to be held in 1982 will be selected from the following general rules, which will be referred to by number. Contestants are advised to read the rules carefully when planning their entry for each event. Supplementary rules will be added for the more complex events, such as VHF/NFD.

Please read these rules carefully

Cover and summary sheets and up to 10 log sheets can be obtained from the contest adjudicator. If you are entering a contest it is only necessary to tick the bottom of the cover sheet (Form 427) and enclose a large sae. All stationary is A4 size (30 by 21 cm); envelopes which hold flat sheets will carry far more than those which require the sheets to be folded. Larger quantities of log sheets may be purchased from RSGB Publications (Sales). Queries on vhf contests should be made to Roger Taylor, G4BEL, tel Ely 740355.
1. Date and time; see individual contest details.
2. All entries must be sent to the adjudicator at the address given with rules for the contest.
3. All operators must be members of the RSGB or have a membership application in progress.
4. Sections
(a) All classes of stations with no separate sections.
(b) Fixed stations only.
(c) Portable stations only.
(d) There will be two sections:
Section S-Single-operator
Section M-Multi-operator
(e) There will be two sections:
Section F-Fixed stations
Section O-All other stations
(f) There will be four sections:
Section S-Single-operator fixed stations
Section A-Single-operator portable or alternative address
Section M-Multi-operator fixed stations
Section P-Multi-operator portable or alternative address.

In fixed station sections, the station must be located at the main address as shown on the licence.

Single-operator stations are those operated by an individual operator who received no assistance whatsoever with the operating or log-keeping during the contest.

All equipment, including antennas and masts, for portable stations must be installed on site during the 24h preceding the contest, or during the contest itself. This does not

Code letters for use in RSGB contests

County/Region	Letters
Alderney	ALD
Antrim	ATM
Armagh	ARM
Avon	AVN
Bedfordshire	BFD
Berkshire	BRK
Borders	BDS
Buckinghamshire	BKS
Cambridgeshire	CBE
Central	CTR
Cheshire	CHS
Cleveland	CVE
Clwyd	CWD
Cornwall	CNL
Cumbria	CBA
Derbyshire	DYS
Devon	DVN
Dorset	DOR
Down	DWN
Dumfries & Galloway	DGL
Durham	DHM
Dyfed	DFD
Essex	ESX
Fermanagh	FMH
Fife	FFE
Mid Glamorgan	GNM
South Glamorgan	GNS
West Glamorgan	GNW
Gloucestershire	GLR
Grampian	GRN
Guernsey	GUR
Gwent	GWT
Gwynedd	GDD
Hampshire	HPH
Hereford & Worcester	HWR
Hertfordshire	HFD
Highlands	HLD
Humberside	HBS
Isle of Man	IOM
Isles of Scilly	IOS
Isle of Wight	IOW
Jersey	JER
Kent	KNT
Lancashire	LNH
Leicestershire	LEC
Lincolnshire	LCN
Greater London	LDN
Londonderry	LDR
Lothian	LTH
Greater Manchester	MCH
Merseyside	MSY
Norfolk	NOR
Northamptonshire	NHM
Northumberland	NLD
Nottinghamshire	NOT
Orkney	OKE
Oxfordshire	OFE
Powys	PWS
Salop	SLP
Sark	SRK
Shetland	SLD
Somerset	SOM
Staffordshire	SFD
Strathclyde	SCD
Suffolk	SFK
Surrey	SRY
East Sussex	SXE
West Sussex	SXW
Tayside	TYS
Tyne & Wear	TWR
Tyrone	TYR
Warwickshire	WKS
Western Isles	WIL
West Midlands	WMD
Wiltshire	WLT
North Yorkshire	YSN
South Yorkshire	YSS
West Yorkshire	YSW

apply to storage of equipment, or to its prior installation more than 1km away from the contest operating position. Portable stations may be required to provide proof of permission to use a site.

5. Locations

(a) Entrants may not change the location of their stations during the contest.

(b) Entrants may change the location of their stations during the contest on one occasion provided that only the highest scoring contact with a given station is claimed in the event of a repeat contact. Repeat contacts must be clearly marked as such in the contest log.

(c) In multiband events all stations forming one entry must operate from within a circle of 1km radius.

6. Modes

(a) Contacts may be made on all permitted modes.

(b) Entrants may transmit only A1 (cw) or F1 (fsk) and contact only other stations transmitting these modes.

7. (a) Contacts made between the distances shown in the table will score as indicated. Contacts on borders between scoring rings score low.

Km	Points	Km	Points	Km	Points
0-50	1	150-200	7	300-350	13
50-100	3	200-250	9	350-400	15
100-150	5	250-300	11	400-450	17

and pro rata

Note that: *(i)* all radial rings are 50km wide; *(ii)* all possible scores are odd numbers.

(b) Contacts will be scored at one point/kilometre.

8. Final tabulation of multiband contests

(a) The final tabulation showing the overall results will be formed by taking the simple sum of the scores achieved on each band.

(b) The final tabulation showing the overall results will be formed by taking the sum of the points gained by dividing the scores achieved on each band by the leading stations score on that band and multiplying by 1,000.

ie Points for each band: $\frac{\text{Score achieved from Rule 7}}{\text{Band leader's score from Rule 7}} \times 1{,}000$

9. Awards

In each section there will be an award to the highest scoring station. An award will also be made to the runner-up in each section in which there are 10 or more entries. In multiband events a certificate will be awarded to the highest scoring on each band who has not qualified for either the overall winners or runners-up award. Additional awards will be made when appropriate.

10. Crossband contacts

(a) Crossband contacts do not count for points.

(b) Half points may be claimed by both stations for a crossband contact if two-way communication cannot be established on the same band.

11. Repeat contacts

(a) Only one scoring contact may be made with a given station on each band covered by the contest (ie callsigns that are fixed, /A, /P or /M, or the same set of equipment used, by a non-competing station, under a different callsign, all count as one station). If a station has moved location and is contacted a second time, only the higher scoring contact may be claimed.

(b) One contact may be made with a given station (as defined in 11a) during each activity period. Only three out of seven activity periods will count towards the final score. However, all available logs should be sent to the adjudicator for the purpose of checking. To be eligible for an award an entrant must take part in a minimum of three activity periods. Serial numbers start at 001 for each activity period and advance by one for each contact.

12. Contest exchange

The contest exchange shall consist of:

(a) Both callsigns, RS or RST report followed by serial number, both QTH locator (the standard five-symbol location system) and QTH.

(b) Both callsigns, RS or RST report followed by serial number, and QTH locator (the standard five-symbol location system).

13. Serial numbers start at 001 and advance by one for each contact. For multiband single-callsign events, the serial number advances by one independent of changes of band, but each band must be tabulated on separate log sheets for the purpose of submitting an entry.

For stations operating within the British Isles (excluding Eire) the QTH must be given as a direction and distance up to 25km (to the nearest kilometre) from a point identifiable on an Ordnance Survery route planning map (scale 1:62,500). For a station operating from outside the British Isles (excluding Eire), the QTH must be readily identifiable.

In multiband contests, when required as part of the exchange, the QTH must be given in a different form on each band.

No points will be lost if a non-competing station being contacted by an entrant is unable to supply a QTH locator or serial number, but the receiving operator must obtain enough information to be able to calculate the claimed distance score.

Contacts with stations whose callsigns appear on the station cover sheet(s) will not count for points.

14. Log keeping

Entrants must keep their own log records in accordance with licence requirements. The logs for contest entries must be made out on current RSGB contest log sheets or, if computer readout sheets are to be submitted, these must be cut to A4 size, format and be line spaced to contain approximately 30 contacts per sheet, or less.

Separate logs are required for each band used in the contest.

Logs must be tabulated as follows:

(a) Date/time (gmt)
(b) Callsign of station worked
(c) My report on his/her signals and serial number
(d) His/her report on my signals and serial number
(e) QTH locator received
(f) QTH received
(g) Points claimed.

15. A station must operate within the terms of his/her normal licence. (This excludes high power permits.)

16. A station must not engage in more than one contact concurrently.

17. The equipment comprising the station may be used under one callsign only for contest purposes, on any given band. This does not preclude the use of shared equipment for talkback purposes.

18. Stations using telephony in the recognized cw sub-bands 70·025-70·150MHz, 144·00-144·15MHz, 432·00-432·15MHz and 1,296·00-1,296·15MHz, or transmitting on beacon frequencies, are liable to disqualification. Entrants should observe the provisions of the IARU/RSGB band plans.

19. Stations that persistently radiate poor quality signals, or otherwise contravene the code of practice for vhf/uhf contest operations (see below), are liable for disqualification or loss of points.

20. Special event callsigns (eg GB) may not be used.

21. Contacts made via a repeater, man-made satellite or moonbounce will not count for points.

22. Proof of contact may be required.

23. Entries

(a) All entries must be accompanied by a current RSGB vhf/uhf contest cover sheet (Form 427) for each band used. The cover sheet must be completed correctly and the declaration signed. In multiband events entrants must also ccomplete a multiband summary sheet (Form 4422).

(b) All entries must be postmarked not more than 15 days after the end of thecontest.

(c) All entries become the property of the RSGB and cannot be returned.

(d) Gross errors in log keeping render the entrant liable to disqualification.

24. Stations must permit inspection of their station by members of the VHF Contests Committee, and give site access information if requested to do so.

25. Failure to comply with any of the rules given for a particular contest may result in loss of points or disqualification.

26. The ruling of the Council of the RSGB shall be final in all cases of dispute.

General rules for RSGB listeners' vhf/uhf contests 1982

1. The following general rules for vhf/uhf contests published in this issue shall apply: 1, 2, 3, 4a, 5a, 7a, 11a, 21, 23, 25, 26.

2. Listeners' contests are open to all non-licensed members of the RSGB. Only the entrant may operate the receiving station.

3. Logs must show in columns: **(a)** date/time (gmt), **(b)** callsign of station heard, **(c)** my report on his/her signals, **(d)** report and serial number sent by station heard, **(e)** callsign of station being worked, **(f)** QTH locator given by station heard, **(g)** QTH given by station heard (where appropriate), **(h)** points claimed.

On 144MHz the callsign in column **(e)** may occur only once in every 20 contacts logged. CQ and test calls do not count for points and should not be logged. If both sides of a QSO can be heard, both can be claimed for points.

The Hanson Trophy will be awarded to the entrant with the highest aggregate score in all the swl contests between 6 March and 5 September 1982.

Code of practice for vhf/uhf contest operation

1. Obtain permission from the landowner or agent before using the site, and check that this permission includes right of access. Portable stations should observe the Country Code.

2. Take all possible steps to ensure that a site is not going to be used by some other group or club. Check with the local club and last year's results table to see if any group used the site last year (QTH locator). If it is going to be used by another group, come to an amicable agreement before the event. Groups are advised to select possible alternative sites.

3. All transmitters generate unwanted signals; it is the level of these signals that matters. In operation from a good site, levels of spurious radiation which may be acceptable from the home station may well be found excessive by nearby stations (up to 25 miles or even farther).

4. Similarly, all receivers are prone to have spurious responses or to generate spurious signals in the presence of one or more strong signals, even if the incoming signals are of good quality. Such spurious responses may mislead an operator into believing that the incoming signal is at fault, when in fact the fault lies in his own receiver.

5. If at all possible, critically test both receiver and transmitter for these undesirable characteristics, preferably by air test with a near neighbour before the contest. In the case of transmitters, aim to keep all in-amateur-band spurious radiations, including noise modulation, to a level of −90dB relative to the wanted signal. Similarly, every effort should be made to ensure that the receiver has an adequate dynamic range.

6. Above all, be gentlemanly at all times. Be helpful and inform all stations apparently radiating unwanted signals at troublesome levels—having first checked your own receiver! If asked to close down by a government or Post Office official, do so at once without objectionable behaviour. If the site owner requests your station to close down, accede to his request without hostility.

First 1·8MHz Contest 1982 rules

1. Aim of contest. To encourage the use of the 1·8MHz band.

2. Eligible entrants. Single-operator stations only. British Isles entrants must also be members of the RSGB.

3. Period. 2100gmt Saturday 13 February to 0100gmt Sunday 14 February 1982.

4. Sections.

(a) British Isles stations.
(b) Overseas stations including EI.

5. Frequencies/Mode. 1·8-2·0MHz cw only. British Isles stations should note that overseas stations may be allocated different parts of the band: eg Austria, 1·823-1·838MHz; France, 1·826MHz only; Netherlands, 1·825-1·835MHz; USSR 1·850-1·950MHz.

6. Contest call and exchange. CQ test, RST plus serial number starting at 001. British Isles stations must also give their county code as published in this issue of *Radio Communication.*

7. Scoring.
(a) British Isles section. Three points for each contact, with a bonus of five points for the first contact with each new British Isles county/region, and the first contact with each new country outside the British Isles.
(b) Overseas section. Three points for each contact with a station in the British Isles (not EI), with a bonus of five points for the first contact with each new county/region.
8. Logs. Log sheets to be headed: date/gmt; call sign; RST/number sent; RST/number received; code received; bonus; points.
9. Declaration. Each entry must be accompanied by the following declaration, signed and dated: "I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and agree that the decision of the Council of the RSGB shall be final in all cases of dispute".
10. Address for logs. RSGB HF Contests Committee, c/o D. S. Booty, 139 Petersfield Avenue, Staines, Middlesex TW18 1DH, England.
11. Closing date for logs. Logs must be postmarked no later than Monday 1 March 1982.
12. Awards
(a) The Somerset Trophy will be awarded to the winning station in the British Isles section, and certificates of merit to the second and third placed entrants.
(b) The Maitland Trophy will be awarded to the Scottish entrant with the highest aggregate number of points in this contest combined with the second 1·8MHz Contest 1981
(c) Certificates of merit will be sent to the first three stations in the overseas section, and to the leading entrant from each overseas country.
(d) A certificate of merit will be awarded to the highest placed entry from a station who has not entered a First 1·8MHz Contest before. Candidates for this award should mark their entries "First-time Award".
(e) A certificate of merit will be awarded to the highest placed UK entrant who has achieved pensionable age on or before 13 February 1981. Candidates for this award should mark their cover sheet "Senior Citizen's Award".

70MHz CW Contest 1982 rules

1000-1500gmt, 17 January 1982

The following general rules, published in the January 1982 issue of *Radio Communication*, will apply: 1, 2, 3, 4a, 5a, 6b, 7a, 9, 10a, 11a, 12a, 13-26.

All entries and checklogs to: VHF Contests Committee, c/o Mr F. Mathews, G8ACJ, Easedale, Woodway, Merrow, Guildford, Surrey.

432MHz Fixed Contest 1982 rules

1000-1500gmt, 7 February 1982

The following general rules, published in the January 1982 issue of *Radio Communication,* will apply: 1, 2, 3, 4b & d, 5a, 6a, 7a, 9, 10a, 11a, 12a, 13-26.

All entries and checklogs to: VHF Contests Committee, c/o Mr C. Sharpe, G2HIF, 20 Harcourt Road, Charlton House Estate, Wantage, Oxon OX12 7DQ.

144MHz QRP Contest results

As requested last year this contest was divided into four sections, and no complaints were recorded concerning this arrangement. The contest required entrants to appreciate their equipment, antenna systems, coaxial feeders, site etc. Conditions were normal to flat and the weather fine even on mountain tops. Problems were caused by more than one station or group arriving at a chosen site as there was no prior official registration of the site. This also made site location and inspection difficult.

There were complaints that more than 1W of power was being used, for example 10-25W from standard equipment, and even higher power. The committee has decided that the 144MHz QRP Contest has outrun its original intention of using home-built equipment, due to the advent of the black boxes, so for 1982 a 432MHz event will be held instead.

Logs were reasonably presented but many stations did not give their section in the appropriate 427 box, indeed one group did not add /P on the sheet but was located some 3,500ft asl.

A noted remark was "points scoring per QSO comparable with using QRO".

G8ACJ

Information on leading stations
Section S: G4CYA at 650ft asl. Two 12-el ZL-Specials at 60ft agl.
Section A: EI2VCA/P at 2,296ft asl. 9-el F9FT at 18ft agl.
Section M: G8RZP at 240ft asl. 14-el Parabeam at 29ft agl.
Section P: G8SJP/P at 400ft asl. Masthead preamp, 20-el broadside array at 35ft agl.

SECTION S

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G4CYA	868	139	ZN43	PA0BWL	498
2	G3NPB	655	70	XK63	G8EAH/P	530
3	G8NQP	435	92	ZL71	EI3VCA/P	—
4	G8RYK	420	90	ZN74	GJ3YHU/A	424
5	G8RXH	409	96	AL32	EI3VCA/P	460
6	G4BVY	361	83	YM79	F6FLB/P	307
7	G3XBY	348	80	ZM52	GM4IFG/P	368
8	G4FBK	317	58	ZL39	G8AMZ/P	360
9	G8MMG	257	70	YN79	GM8BJF/P	280
10	G3BPM	205	58	ZL48	G3ZSS/P	325
11	G4AGO	134	50	ZL66	F1FYN/P	259
12	G6AFH	107	24	YN49	GM8OFV/P	281

SECTION A

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	EI3VCA/P	1,495	127	WN79	G3YMD/P	555
2	G8AUN/P	1,290	120	AM06	DK6XY	645
3	G8AMZ/P	955	110	YO29	G8ORZ/P	472
4	G8NCC/P	951	145	ZN73	DB6DC	638
5	G8RBY/P	796	114	YL63	PE1FPC	605
6	GW8ZPC/P	635	123	YN74	G3DAH	352
7	ON8OK/P	611	69	BK18	GW4ERP/P	516
8	GM8OFV/P	413	65	YP14	GW4IDG/P	410
9	G8JXV/P	366	84	ZL60	G8AMZ/P	380
10	GM8GEG/P	268	58	YQ63	G8AUN/P	450
11	G3XWZ/P	216	40	ZN62	G4BJO	185

SECTION M

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G8RZP	2,320	264	AL45	DF8LC	708
2	G3NNG	1,355	217	ZL23	GM8GSV/P	574
3	G8ZHP	996	146	ZM29	PE1CQQ	434
4	G4MDU	578	128	ZM56	GI4LKA	419
5	G4LNV	419	97	ZL46	EI3VCA/P	407
6	G8MLO	416	80	AL41	EI3VCA/P	475
7	G4KWQ	302	112	YM30	GJYHU/A	384
8	G8TLQ	215	33	YO33	G3NNG	354
9	G4FUH	191	36	ZN37	EI3VCA/P	385

SECTION P

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G8SJP/P	2,372	290	AN61	DC5BT/P	565
2	GW4ERP/P	1,989	292	YN75	PE1CKK	—
3	G4DEZ/A	1,790	201	AL34	DC6KL	520
4	G8EAH/P	1,662	206	ZO77	GJ3YHU/A	549
5	GW4IDG/P	1,420	219	YM75	GM8KPH/P	521
6	G3YMD/P	1,392	161	AL76	E13VCA/P	557
7	GW3JUL/P	1,336	180	YM04	ON1ARY	563
8	G4JXG/P	1,317	168	AL14	—	—
9	GW3UFB/P	1,063	171	YM55	GM8GEC/P	427
10	G3PQY/P	1,016	112	ZN19	DG1DJ	601
11	G3LTY/P	978	150	AL55	E13VCA/P	522
12	GM8MNG/P	943	107	YP17	G8RCF	554
13	G8VWH/P	935	171	ZL17	DL1EAL/P	540
14	G6APZ/P	912	164	ZN52	ON8QK/P	436
15	G8ORZ/P	895	119	XK30	PA0FHG/P	630
16	G4JKM/P	864	181	YL18	GM8DX	410
17	GW4KKC/P	833	139	YM75	GM8GSV/P	506
18	G4DDL/P	796	138	YK18	GM8YJU	465
19	G8JAY/P	780	152	ZL01	GM8GSV/P	534
20	G3ORA/P	747	135	YL57	GM8MNG/P	504
21	GW4HNZ/P	689	128	YL15	F6FLB/P	345
22	G8KAX/P	679	128	ZN41	G3NPB	437
23	G8NRJ/P	610	70	AM39	DL2OM/P	442
24	G3UUP/P	563	105	ZL74	GM8MNG/P	536
25	G6GS/P	530	138	ZL69	G8AMZ/P	414
26	GM8GSV/P	519	57	XQ46	PA0FHG/A	782
27	G8KGI/P	484	108	ZK05	G8AMZ/P	415
28	G8OHM/P	434	106	YM50	GM8MNG/P	380
29	G6BSE/P	416	64	AM64	DL2KAL/A	435
30	G2SU/P	396	79	ZN11	G3NPB/P	467
31	GW3ITZ/P	374	84	YN65	GM8KPH/P	375
32	G4EDV/P	362	56	YO54	—	—
33	G3RSC/P	220	64	ZM31	EI3VCA/P	320
34	G4JCM/P	210	36	YP50	G3NNG	428
35	G4IQM/P	187	55	AL71	G8ORZ/P	275
36	G6OI/P	166	55	YM49	EI2CA	285

LISTENER SECTION

Posn	Station	Points	QSOs	QRA	Best dx	Km
1	BRS32525	472	100	AL41	GD6UQ/P	437
2	BRS15822	179	41	ZL40	GD6UQ/P	420
3	BRS28198	128	22	AK04	DL6EAH	415
4	RS44631	56	16	YN79	EI2CA	265

Thanks for check logs received from G4DRO, G8OEG and G8XTV (ex-G2FWX).

RSGB UHF/SHF Contest October 1981 results

This year's event was marred by a low pressure system (985mB at BRS32525). Conditions were described as: "Poor with vague improvements on Sunday", *G3NNG/P;* "Very peculiar", *G8ZHP;* even "Poor to abysmal", *G4DDL*. Portable operators especially suffered from the "rain, gales and cold", said G4MHC/P.

As a consequence less dx was worked, a distinct lack of activity was noted, and fewer contest entries were received. On the other hand it is encouraging to include the 5·7GHz band.

A number of stations had obviously not read the rules pertaining to this contest and had not sent QTH information as well as the QTH locator (which was not required for the concurring IARU event), or scored with the radial ring system rather than on a one point per kilometre basis.

The standard of logkeeping was very varied indeed—the adjudicator's special thanks go to G8ZHP, G8GDZ and G8KAX for their very neat and accurate handwritten logs.

Congratulations to the winners and runners-up in all sections, and a thank you to all those stations who made the effort of going out portable under adverse conditions!

432MHz SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km	Power
1	G8JVM	16,909	90	ZL31c	DJ9DL	622	150
2	G8EGG	8,624	88	ZL77h	PA0PLY/A	410	50
3	G8ZRR	6,899	67	ZM25j	PA0WRC/P	466	50
4	G8KAX	3,538	46	AL32g	DL0SO/A	478	90
5	G4DDL	3,017	31	ZL47f	PA0CIS/P	410	10
6	G5UM	2,391	26	ZM35b	F6CTT/P	333	10
7	G4LRT	1,777	12	ZM45d	DF7VX	674	400
8	G8LXY	1,067	20	ZL09f	G8TFI/P	135	50
9	G8ITS	656	17	ZL40e	G8TFI/P	153	—

432MHz MULTI-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km	Power
1	G4JAR/P	41,673	167	AL47b	DL7QY	671	400
2	G8TFI/P	31,397	156	YL29j	DJ9DL	655	400
3	G3JOC	28,847	114	AM27c	DG4FAO	639	400
4	G3PIA/P	18,950	130	ZL33h	DF1JC	592	400
5	G8ZHP	17,677	111	ZM29h	F1KNO	626	200
6	G4MHC/P	15,237	112	YM79a	F1EBN	516	50
7	G4JDI/P	6,907	74	ZM13d	F1BZN	612	10

1,296MHz SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km	Power
1	G4KIY	3,872	20	ZM40j	DK2UO	498	10
2	G8DIU	1,734	22	ZL60h	G4CCH	238	25
3	G8GDZ	1,106	12	ZM41g	G3TDG	186	25
4	G4LRT	930	13	ZM45d	G4CCH	124	30
5	G3SEK	269	5	ZL34a	G3SPJ	98	0·5
6	G8KAX	95	4	AL32g	G3TDG	31	3

1,296MHz MULTI-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km	Power
1	G3NNG/P	5,951	45	ZL33h	DJ3ZU	554	20
2	G4BVY/P	4,479	34	YM79a	DK2UO	620	20
3	G3ZUD/P	2,744	28	ZM13d	G3XDY/P	194	150
4	G8GXE/P	930	10	YL29j	G3OSS	147	4

5,760MHz SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km	Power
1	G8ADC	37	1	ZL18b	G3BNL	37	10

10,368MHz SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km	Power
1	G3YGF/P	190	2	ZL15c	G3JVL	116	10
2	G4KNZ/P	74	1	ZL15j	G4MBS	74	10

Gratefully acknowledged are checklogs from G4BPO/P, G3XD/P, and G4ANT; an swl log from BRS32525, achieving 3,382 points for 56 monitored contacts on 432MHz; an activity report from G3OSS; and information about one-way contacts on 2·3GHz between G8LMW/P and G4DDK, and on 10GHz between G4FRE/P and G3LQR.

G4KGC

ROPOCO 2 1981 results

Without exception, all who commented found this contest extremely enjoyable. The interest added by the variable length and format of the postcodes seemed to keep everyone on their toes! There was much speculation on the progressions that must have led to some of the more exotic codes exchanged. Of particular interest was 9L51LEE! This appears to have started life as GL516EE and after passing through various other mutations finished the contest as LE11255! The contest must be as enjoyable to adjudicate as to operate in.

Check logs from G3VDL, G3WRR, G4FSN and G8GF are acknowledged with thanks.

Comments

"Very enjoyable and friendly contest; Timing and length ideal; Would like bonus points for north/south QSOs; Hate to think where letters would arrive if addressed with some of the received codes; Nearly 30 per cent of received postcodes were impossible; Everybody giving 5NN—but so do I! Think NFD and AFS should use similar exchange; Operated /P—four passers-by asked if I was a cber; This contest gets zippier and zanier each time!"

G3MXJ

Posn	Callsign	Points
1	G3NOM	466
2	G4DRS	456
3	G3SJE	446
4	G4MCC	438
5	G4BUO/P	414
6	G3YMC	410
7	G3LQI	398
8	G2VJ	390
	G4BOU	390
10	G4DJX	380
11	G2PT	370
12	G3BFP	368
13	G8VF	340
14	G4KFE	320
15	G3HKO	300
	G4GLC	300
	G4IUZ	300
18	G3NKS	298
19	G4CZB	290
20	GW3SB	288
21	G4HZF	286
22	G3BWR	270
23	G3AWR	260
24	G3BPM	258
25	G3MCK	250
26	G3ZOG	212
27	G4HVC	210
28	G3BPE	200
29	G3JKS	190
30	G3XQX	188
	G4HSD	188
32	G4KWU	80

DF Qualifying Event Dartford Heath results

This event, held on 21 June 1981, still seems well-remembered by certain competitors despite the passage of several months. Twenty teams assembled at Shipbourne Common in sunny conditions, unaware of the horrors to follow.

Station "A", G3ZOH/P, was located on one of several islands by the railway at East Peckham, 10km south-east of the start. Competitors requiring access to the site had to negotiate a flimsy log bridge, or be prepared to get slightly damp. Trevor Gage was the first to clock in at 1433.

Station "B", G4BDF/P, was 13km north-east of the start on the River Medway near Snodland, in an area that would make even David Bellamy envious! Once in the area competitors had to negotiate a minimum of one river (two if they were on the wrong side of the Medway!). Muttering a stream of death threats, Brian Bristow was the first to clock in at 1510, closely followed by Chris Plummer at 1514. After the last transmission at 1630 several competitors were still negotiating the terrain, rapidly disappearing as the tide came in. Among them were Eric Mollart and Chris "Canute" Plummer, who, rumour has it, was crying for help!

At the tea afterwards competitors reflected upon the afternoon's proceedings, and, swearing vengeance, Roger Parsons described how he had won one of the worst dfs he had ever encountered!

Posn	Name	Club	Time of arrival Station "A"	Station "B"
1	R. Parsons	Burton	1442	1541
2	M. Hawkins	Chelmsford	1437	1543
3	T. Gage	Mid-Thames	1433	1552
4	V. North	Mid-Thames	1605	1517
5	B. Bristow	Mid-Thames	1606	1510
6	P. Lisle	Mid-Thames	1625	1521
7	C. Wells	Mid-Thames	1441	1628
8	A. Butcher	Chelmsford	1502	1629
9	G. Foster	Stratford/Avon	1447	–
10	M. Easterbrook	Dartford Heath	1450	–
11	E. Mollart	Mid-Thames	1501·5	–
12	C. Plummer	Mid-Thames	–	1514
13	P. Homer	Dartford Heath	–	1519
14	I. Butson	Colchester	–	1542
15	R. Shepherd	Mid-Thames	–	1542·5
16	P. Woollett	Dartford Heath	–	1544
17	R. Brocks	Chelmsford	–	1545
18	W. Pechey	Mid-Thames	–	1551
19	D. Newman	Slade	–	1557
20	R. Goodearl	Mid-Thames	–	–

T. Gage and W. North qualify for the National Final.

Contests calendar

January	Cumulative Activity Periods *(Rules in December issue)*
1 January	AGCW *(Rules in December MOTA)*
10 January	Affiliated Societies *(Rules in December issue)*
16 January	First Quadruple Night DF *(Rules in January issue)*
16-17 January	HA DX *(Rules in January MOTA)*
16-17 January	Third International 160m Phone *(Rules in December MOTA)*
17 January	70MHz CW *(Rules in January issue)*
23-24 January	White Rose SWL *(Rules in October issue)*
29-31 January	CQ WW 160m CW *(Rules in January MOTA)*
30-31 January	French DX CW *(Rules in January MOTA)*
31 January/ 28 March	70MHz Cumulative *(Rules in January issue)*
6-7 February	7MHz Phone *(Rules in August issue)*
7 February	432MHz Fixed *(Rules in January issue)*
13-14 February	1·8MHz (First) *(Rules in January issue)*
26-28 February	CQ WW 160m Phone *(Rules in January MOTA)*
27-28 February	French DX Phone *(Rules in January MOTA)*
27-28 February	7MHz CW *(Rules in August issue)*
6-7 March	144, 432MHz & SWL
13-14 March	Commonwealth *(Rules in November issue)*
20 March	AGCW—DL UHF/VHF CW (432MHz) *(Rules in June 4-2-70)*
20-22 March	BARTG Spring RTTY 1982
3 April	1,296MHz Trophy
4 April	432MHz Trophy & SWL
4 April	ROPOCO 1
18 April	144MHz CW
18 April	Low Power
25 April	10GHz Cumulative 1982
1-2 May	432/1,296/2,304MHz
2 May	144MHz Low Power
16 May	10GHz Cumulative 1982
16 May	Region Round-up
22-23 May	144MHz
5-6 June	NFD
13 June	70MHz & SWL
20 June	10GHz Cumulative 1982
26-27 June	1·8MHz (Summer)
3-4 July	VHF NFD
11 July	10GHz Cumulative 1982
18 July	3·5MHz Field Day
8 August	10GHz Cumulative 1982
15 August	70MHz Trophy & SWL
29 August	ROPOCO 2
4-5 September	144MHz & SWL
4-5 September	IARU 144MHz
4-5 September	SSB FD
19 September	10GHz Cumulative 1982
2-3 October	432MHz-2·4GHz & SWL
2-3 October	IARU VHF
10 October	21/28MHz Phone
17 October	21MHz CW
October/ December	432MHz Cumulatives
October/ December	1,296MHz Cumulatives
6-7 November	144MHz CW
6-7 November	Marconi Memorial CW
13-14 November	1·8MHz (2nd)
5 December	144MHz Fixed

First Quadruple Night DF Contest

Date: 16 January
Map: OS 1:50,000 No 109 (Manchester)
Time: 1900 for first transmission at 1920.
Closedown is at midnight.
Location: Sale Moor Community Centre, Norris Road, Sale, ngr 798 909.

Supper will be provided after the event. Will intending competitors please advise numbers to Mr D. Bolton, tel 061-998 4245 home, 0625 528087, work, or Mr D. Holland, tel 061-973 1837, before 10 January.

DF Qualifying Event Slade results

Slade's qualifying event this year took place on the Kidderminster & Wyre Forest map. There were 22 teams which started from Hartlebury Common, Stourport-on-Severn. The common being crossed with power lines and Radio One, a good 5-and-9 when the sense circuit was used did not prevent any of the competitors from obtaining good bearings on station "A" sited four miles west on Abberley Hill. The 400ft climb and 300 acres of forest to search made the going unpleasant on a warm day.

Only two competitors admitted hearing station "B", which was hidden in brambles 15 miles north east, near Bridgnorth. The organizer gave an approximate bearing of 333° ± 5°, and a distance of over 10 miles in accordance with the rules. Unfortunately this made finding the station a lot easier than anticipated, half of the competitors elected to try for station "B" first and had a more successful day.

Sixty one people sat down for tea, with first and second prizes going to Bill North and Roger Parsons respectively. The traditional box of chocolates went to Doreen Pawley of Mid-Thames, the first all-ladies team. Roger Parsons was also presented with the Bert Simmonds Memorial Trophy.

(Continued on page 60)

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

Alterations and additions to this list should be sent to the organizer, Mr M. A. C. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.

Clock time	Callsign	MHz	Mode	Town	Notes
Sundays					
0915	G3LEQ	144·250	A1/A3J		
		145·250	F2/F3	Knutsford, Cheshire	[6]
		1·950	A2/A3		
		29·250	F2/F3		
0930	G3WNR	145·450	F2/F3	South Shields, T & W	[1]
1015	G3CGD	1·875	A1/A3	Cheltenham, Glos	
1100	G2FXA	1·910	A1/A3/A3J	Stockton-on-Tees	
1100	G3XJJ	3·535	A1/A3J	Northampton	
1130	G3BLS	145·375	F2	Osney, Oxford	[1]
1200	G4BFJ / G4DKK	144·625	F2/F3	Banstead, Surrey Tooting, SW London	
1200	G3HVI	145·250	F2/F3	Stoke-on-Trent, Staffs	[1]
1200	G3GNS	1·910	A1		
		3·550	A1	Locking, Avon	[13]
		144·250	A1		
1400	G3LZV	145·250	F2/F3	Manchester	[3]
1800	G3WNR	145·450	F2/F3	Soutth Shields, T & W	[1]
1800	G4DVZ	1·910	A1/A3J	Leeds, Yorks	
1815	G3LEQ	144·250	A1/A3J		
		145·250	F2/F3	Knutsford, Cheshire	[6]
		1·950	A2/A3		
1900	G3RLO	144·525	F2/F3	West Bridgford, Notts	[1]
1900	GW3WSU / GW4GSH	145·250	F2	Barry, S Glam	[1] [9]
1930	G3LDW	144·160	A1/A3J	Halesowen	[1]
2000	G3LZV	145·250	F2/F3	Manchester	[3]
2000	G4JBB	145·425	F2	Birmingham	[10]
2100	G4EWK	144·850	F2	Burton-on-Trent, Staffs	[7]
2100	GW4LLE	145·525	F2/F3	Milford Haven, Dyfed	
Mondays					
1100	G4IRI	3·550	A1/A3J	Bolton, Lancs	
1830	G3GNS	1·910	A1		
		3·550	A1	Locking, Avon	[13]
		144·250	A1		
1900	G3RLO	144·525	F2/F3	West Bridgford, Notts	[1]
1900	G4ILD	145·525	F2/F3	Rishton, Lancs	[1]
1930	G4BFJ / G4DKK	144·625	F2/F3	Banstead, Surrey Tooting, SW London	
1930	GI3SXG	144·100	A1/A3J	Newtownards, Co Down	
1930	G4JIZ	145·350	F2/F3	Bakewell, Derbys	[1]
2000	G2FXA	145·525	F2/F3	Stockton-on-Tees	[1]
2000	G3LZV	145·250	F2/F3	Manchester	[3]
2000	G4IRI	3·550	A1/A3J	Bolton, Lancs	
2000	G4JDL	144·250	A1/A3J	Solihull, W Midlands	[2]
2030	G3ASR	1·875	A1/A3J		
		144·175	A1/A3J (lsb)	Harrow, Middlesex	[1] [12]
2030	G2FKO	145·525	F2	Bideford, Devon	
2100	G3WOR	144·250	A1/A3J	Lancing, Sussex	[14]
2200	G3GMS	145·250	F2/F3	Whitley Bay, T & W	[1]
Tuesdays					
1200	G3GNS	1·910	A1		
		3·550	A1	Locking, Avon	[13]
		144·250	A1		
1830	G4CWN	144·100	A1/A3J	Stoke-on-Trent, Staffs	
1900	G3RLO	144·525	F2/F3	West Bridgford, Notts	[1]
1900	G3ZRZ	1·975	A1/A3	Blackpool, Lancs	
1900	G4RS	3·565	A1/A3J		
		145·525	F2/F3	Catterick, N Yorks	[1]
1930	G3ZYY	145·550	F2/F3	Saltash, Cornwall	[5]
1930	G4BFJ / G4DKK	144·625	F2/F3	Banstead, Surrey Tooting, SW London	
2000	G3VHE	145·350	F2	Swindon, Wilts	[1]
2000	GM4ELV	144·250	A1	Arrochar, Strathclyde	
2000	G4FEX	144·250	F2/F3	Horsley Woodhouse, Derbyshire	[1]
2030	G3IRM	1·975	A1/A3	Bury St Edmunds, Suffolk	
2030	G3OHM/A	144·180	A1/A3J	Birmingham	
2030	G3KGU	1·915	A1/A3	Theydon Bois, Essex	
2030	G2FKO	145·525	F2	Bideford, Devon	
2100	G4EWK	144·850	F2	Burton-on-Trent, Staffs	[7]
2200	G3AWL	144·110	A1/A3J	Easington, Co Durham	[8]
Wednesdays					
1830	G3WNR	145·450	F2/F3	South Shields, T & W	[1]
1830	G3GNS	1·910	A1		
		3·550	A1	Locking, Avon	[13]
		144·250	A1		
1900	G3RLO	144·525	F2/F3	West Bridgford, Notts	[1]
1900	GW3WSU / GW3GSH	145·250	F2	Barry, S Glam	[1] [9]
1900	G2ABC	145·250	F2/F3	Truro, Cornwall	
1900	G3ULY	3·583	A1	Culgaith, Cumbria	[1]
	G4EXD	145·475	F2		
1900	G4ILD	145·525	F2/F3	Rishton, Lancs	[1]
1930	G4JIZ	145·350	F2/F3	Bakewell, Derbys	[1]
1930	G3ZYY	145·550	F2/F3	Saltash, Cornwall	[5]
1930	G4BFJ / G4DKK	144·625	F2/F3	Banstead, Surrey Tooting, SW London	
2000	G2FXA	144·250	A1/A3J	Stockton-on-Tees	[1]
2000	GW4KDP	145·550	F2/F3	Barmouth, Gwynedd	[1]
2000	G3SWP	144·180	A2/A3J	Doncaster, South Yorks	[1]
2000	G3LZV	145·250	F2/F3	Manchester	[3]
2000	GM3ZAS	145·550	F2/F3	Prestwick, Ayrshire	[3]
2030	G2FKO	145·525	F2	Bideford, Devon	
2100	GW4LLE	145·525	F2/F3	Milford Haven, Dyfed	

Clock time	Callsign	MHz	Mode	Town	Notes
Thursdays					
1100	G4IRI	3·550	A1/A3J	Bolton, Lancs	
1830	G3GNS	1·910	A1		
		3·550	A1	Locking, Avon	[13]
		144·250	A1		
1900	G3RLO	144·525	F2/F3	West Bridgford, Notts	[1]
1900	G4BNA	3·590	A1	Swindon, Wilts	
1900	G3BLS	145·375	F2	Osney, Oxford	[1]
1900	G3ZRZ	1·975	A1/A3	Blackpool, Lancs	
1900	G4RS	3·565	A1/A3J		
		145·525	F2/F3	Catterick, N Yorks	[1]
1930	G3ZYY	145·550	F2/F3	Saltash, Cornwall	[5]
1930	G3ASR	1·875	A1/A3J		
		144·175	A1/A3J (lsb)	Harrow, Middx	[1] [11] [12]
1930	G4BFJ / G4DKK	144·625	F2/F3	Banstead, Surrey Tooting, SW London	[15]
2000	G2ACZ	1·819	A1	Mablethorpe, Lincs	
2000	G3LZV	145·250	F2/F3	Manchester	[3]
2000	G3IRI	3·550	A1/A3J	Bolton, Lancs	
2000	GM4ELV	144·250	A1	Arrochar, Strathclyde	
2000	G4JDL	144·250	A1/A3J	Solihull, W. Midlands	[4]
2030	G2FKO	145·525	F2	Bideford, Devon	
2100	G3WOR	144·250	A1/A3J	Lancing, Sussex	[14]
2100	G4EWK	144·850	F2	Burton-on-Trent, Staffs	[7]
Fridays					
1830	G4ILW	145·450	F2/F3	Gateshead, T & W	[1]
1830	G3GNS	1·910	A1		
		3·550	A1	Locking, Avon	[13]
		144·250	A1		
1900	G4FIM	145·550	F2/F3	Leeds, Yorks	
1900	G3RLO	144·525	F2/F3	West Bridgford, Notts	[1]
1930	G4JIZ	145·350	F2/F3	Bakewell, Derbys	[1]
1930	G3HVI	145·250	F2/F3	Stoke-on-Trent, Staffs	[1]
1930	G4BFJ / G4DKK	144·625	F2/F3	Banstead, Surrey Tooting, SW London	
2000	G3WOK	144·775	F2	Hailsham, Sussex	
2030	G2FKO	145·525	F2	Bideford, Devon	
2200	G3AWL	144·110	A1/A3J	Easington, Co Durham	[8]
Saturdays					
0915	G3LEQ	144·250	A1/A3J		
		145·250	F2/F3	Knutsford, Cheshire	[6]
		1·950	A2/A3		
1100	G3LZV	145·250	F2/F3	Manchester	[3]
1200	G3GNS	1·910	A1		
		3·550	A1	Locking, Avon	[13]
		144·250	A1		
1900	G3RLO	144·525	F2/F3	West Bridgford, Notts	[1]
2000	G3LZV	145·250	F2/F3	Manchester	[3]
2000	G4JBB	145·425	F2	Birmingham	[10]
2000	G4FEX	145·250	F2/F3	Horsley Woodhouse, Derbyshire	[1]
2030	G2FKO	145·525	F2	Bideford, Devon	
2100	GW4LLE	145·525	F2/F3	Milford Haven, Dyfed	
2200	G3GMS	145·250	F2/F3	Whitley Bay, T & W	[1]

Notes

[1] Omnidirectional
[2] Horizontal to SE
[3] Vertical to S
[4] Horizontal to NW
[5] Vertical to E
[6] Slant polarized to WNW
[7] To SW
[8] To S
[9] To NE
[10] To NNE
[11] First and third Thursdays in each month
[12] Horizontal
[13] Reports to RAFARS Locking
[14] Horizontal to E and W
[15] Starting speed 12wpm

CONTEST NEWS

(Continued from page 59)

Posn	Name	Club	Time of arrival Station "A"	Station "B"
1	W. J. North	Mid-Thames	1515	1431
2	R. J. Parsons	Burton-on-Trent	1517	1425
3	C. Plummer	Mid-Thames	1517·5	1432
4	T. C. Gage	Mid-Thames	1520	1436
5	P. H. Lisle	Mid-Thames	1523	1442
6	D. Holland	South Manchester	1527	1431
7	R. Shepherd	Mid-Thames	1532	1431
8	D. Yorke	South Manchester	1533	1431
9	A. Butcher	Chelmsford	1539	1448
10	C. D. Merry	Dartford Heath	1542	1448
11	G. A. Whenham	Coventry	1459	1548
12	P. Yeates	Salisbury	1500	1550
13	M. Hawkins	Chelmsford	1441	1554
14	B. J. Mahony	Hereford	1446	1554·5
15	T. Gleeson	South Manchester	1522	1616
16	D. E. Newman	Slade Radio	1459	1616·5
17	A. M. Simmons	Mid-Thames	1435	1617
18	P. M. Williams	Slade	1521	1625
19	P. Woollett	Dartford Heath	1516·5	–
20	G. C. Foster	Stratford-on-Avon	1554	–
21	M. Sheridan	Stratford-on-Avon	1619	–
22	D. Pawley	Mid-Thames	–	1624

C. Plummer, D. Holland and D. Yorke qualify for the National Final.

CLUB NEWS

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organizations will be published in the July 1982 issue.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the **March** issue should reach them by **14 January**, and for the **April** issue by **18 February**.

Club programmes are given in order of date, subject, time and place of the meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current *RSGB Call Book*) unless otherwise stated.

All clubs welcome visitors and would be pleased to hear from potential new members.

COMPOSITION OF RSGB REGIONS

Region 1	Cheshire, Cumbria, Greater Manchester, Isle of Man, Lancashire, Merseyside.
Region 2	All that part of Humberside north of River Humber, North Yorkshire, South Yorkshire, West Yorkshire.
Region 3	Hereford and Worcester, Shropshire, Staffordshire, Warwickshire, West Midlands.
Region 4	Derbyshire, all that part of Humberside south of River Humber, Leicestershire, Lincolnshire, Nottinghamshire.
Region 5	Bedfordshire, Cambridgeshire, Northamptonshire.
Region 6	Berkshire, Buckinghamshire, Oxfordshire.
Region 7	Greater London south of River Thames, Surrey including that part of London north of the Thames administered by Surrey.
Region 8	Kent, East Sussex, West Sussex.
Region 9	Cornwall, Devon.
Region 10	Dyfed, Gwent, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan.
Region 11	Clwyd, Gwynedd.
Region 12	Grampian, Highland, Island Authorities, Tayside.
Region 13	Borders, Fife Lothian.
Region 14	Central, Dumfries and Galloway, Strathclyde.
Region 15	Northern Ireland.
Region 16	Essex, Norfolk, Suffolk.
Region 17	Isle of Wight, Channel Islands, Dorset, Hampshire, Wiltshire.
Region 18	Cleveland, Durham, Northumberland, Tyne & Wear.
Region 19	Greater London north of River Thames, Hertfordshire.
Region 20	Avon, Gloucester, Somerset.

REGION 1—RR W. R. Parkinson, G3FNM, 141 Norris Road, Sale, Cheshire M33 3JR. Tel 061-973 1472.

Accrington (North Western Repeater Group)—23 January, The Bowling Club, Willows Lane, Accrington. Regular meetings on subsequent third Thursdays in each month. Further information from H. A. Aspinall, G3RXH.

Ainsdale (AARC)—5, 19 January. Ainsdale Scout HQ. Details from sec Norman Horrocks, G2CUZ, tel 0704 77604.

Barnoldswick (Rolls-Royce ARC)—First Wednesday in each month, 8pm. Rolls-Royce Sports & Social Club, Barnoldswick. Sec Leslie Logan, G4ILG, tel Barnoldswick 812288.

Blackburn (East Lancs ARC)—First Tuesday in each month, 7.30pm. The Shadsworth Leisure Centre, Blackburn. PRO Norman Jenkin, G4CGT, tel 0254 75037.

Blackpool (B & Fylde ARS)—5 January, 2 February. Details from Jim Newland, G5ND, tel 0253 64508.

Bolton (B & DARS)—Wednesdays, 8pm. Horwich Leisure Centre, Horwich. Sec Alan Hartley, G8PRH, tel Bolton 46023.

Bolton (Red Rose RS)—Details from sec Geoff Mollison, G8VCW, tel Bolton 21424.

Bolton (Edbro RC)—Details from A. L. Brown, c/o Edbro Ltd, Lever Street, Bolton.

Bolton (BTC ARC)—Details from sec, c/o Electronics Dept, Bolton Technical College, Manchester Road, Bolton.

Bolton (Norweb ARC)—Information from C. J. Moulding, G4HYG, c/o Sports & Social Club, Norweb Electricity, Manchester Road, Bolton BL3 2QN.

Bury (BRS)—12 January ("UoSAT", by Mike Cook, G8HBR), 5, 19, 26 January (Informal), 7.30pm. Mosses Community Centre, Cecil Street, Bury. Pub sec Peter Butterworth, tel 061-798 0970.

Carlisle (Border Television ARC)—Details from sec, Border Television Ltd, Television Studios, Carlisle, Cumbria.

Chester (C & DRS)—Meetings Tuesdays (except first in the month), 8pm. YMCA, Chester. Sec P. J. Holland, G3TZO.

Congleton (CARC)—Details from RS42758, 156 Holmes Chapel Road, Congleton, Cheshire CW12 4QB.

Crewe (South Cheshire ARS)—Meetings at RAOB Social Club, Earle Street, Crewe. Information from B. G. F. Roe, G4LVR, tel 0270 665661.

Douglas (IoMARS)—Mondays, fortnightly, Keppel Hotel, Creg-ny-Baa, nr Onchan, Isle of Man. Sec Colin Matthewman, GD4FWQ, tel 0624 22295.

Eccles (E & DRC)—Tuesdays, 8.30pm. The White Swan, Worsely Road, Swinton. Sec C. Harrison, G8KRC, tel 061-797 0031.

Leyland (LHARG)—11 January 7.30pm. Rose & Crown, Ulnes Walton, Leyland. Details from sec Arthur Jolly, G4JCO.

Liverpool (L & DARS)—5 January ("Amateur radio—the knowledge"), 12 January ("The contest computer", by A. V. Neilson, G4CVZ), 19 January (EME project report), 26 January (Junk sale), 8pm. Conservative Rooms, Church Road, Wavertree. Sec Eric Grossmith, G3WOH, tel 051-426 3701.

Liverpool (UoLARS)—The society meets informally in the shack at the top of the Old Union Building, 2 Bedford Street North, Liverpool 7. Further information from sec Peter R. Jones, GW6AJK, c/o UoL Students Union.

Macclesfield (M & DRS)—Second Tuesday in each month. Information from Mrs Mary Roberts, 15 Park Brook Road, Macclesfield, tel Macclesfield 24383.

Manchester (Openshaw TCRC)—Information from the college, Whitworth Street, Openshaw, Manchester M11 2WH.

Manchester (M & DARS)—Wednesdays 7.30pm. Newton Heath Community Centre, 203 Droylsden Road, Newton Heath, Manchester. Sec John Dent, G8OWY.

Manchester (South Manchester RC)—1 January (Club closed), 8 January ("State of the art fet top band transmitter", by David Holland, G3WFT), 15 January (Mini lecture contest), 16 January (Open quadruple night df contest, see "Contest News" in this issue, other details from G3WFT), 22 January ("State of the art 4m transverter" by Chris Ward, G4HON), 29 January ("State of the art df receiver", by Tim Winter, G4AOK), 5 February ("An introduction to Wood & Douglas kits", by Fred Starkie, G8TJG), 8pm. Sale Moor Community Centre, Norris Road, Sale. Informal meetings Mondays in the club shack at the above address. Sec David Holland, G3WFT, tel 061-973 1837.

Manchester (MUARS)—Meetings during term-time on Wednesday afternoons and most lunchtimes in the club shack on the top floor of the Union Building. Further information from the sec, c/o Radio Society, University Union, Oxford Road, Manchester 13.

Manchester (UMIST RS)—During term time, Wednesday afternoons, in the shack on L floor in the Main Building, Thursdays at 9pm in the UMIST union bar. Further information from Duncan Wheelhouse, G8TRP, c/o Radio Society, UMIST Union, Box 88, Sackville Street, Manchester M60 1QD.

Manchester (ICL R & ES)—Information from sec, c/o 4TB, International Computers Ltd, Wenlock Way, West Gorton, Manchester M12 5DR.

Maryport (Solway RC)—"The Settlement", High Street, Maryport, Cumbria. Details from J. J. Hardingham, Woodbine Cottage, Dearham, Maryport, Cumbria.

Oldham (Crompton House CE Comprehensive School RC)—Details from the school, Rochdale Road, Shaw, Oldham OL2 7HS.

Ormskirk (ORC)—Contact sec Kevin Higgins, G4IGX, 8 DelphTop, Greetby Hill, Ormskirk L39 2DX, tel Ormskirk 75546, for further information.

Penrith (Eden Valley RS)—Third Thursday in each month. Two Lions Hotel, Great Dockray, Penrith. Further information from F. D. Shaw, G4HYJ.

Preston (PARS)—Alternate Thursdays. St Mary Magdalene Church Hall, Faringdon Lane, Ribbleton, Preston. Sec G. Earnshaw, G3ZXC.

St Helens (St H & DARC)—7, 14, 21, 28 January 7.45pm. Conservative Club, Boundary Road, St Helens. Morse practice prior to each meeting. Sec Mark Edwards, G4LHL, tel St Helens 31846.

Salford (Dial House RS)—Wednesdays, 5.30pm. Dial House, 21 Chapel Street, Salford. Details from sec, Manchester Central Area Sports & Social Club, c/o M43, Dial House.

Salford (UoSCS)—Wednesdays, 2pm. The shack, room 22, Newton Building. The club station, G4GSU, is again active after a considerable absence. The society is able to cater for the majority of people interested in amateur radio at the university. For further details contact P. Wells, G4GMV, QTHR, or at Salford University Communications Society, University of Salford, Salford M5 4WT.

Stockport (SRS)—13 January (Darwen Electronics, visit by Fred Starkie, G8TJG), 27 January ("Yet more aircraft", a slide show by Stan Aspinall, G3VSA), 8pm. The Blossoms Hotel, Buxton Road, Stockport. Acting sec Stan Aspinall, G3VSA, tel 061-437 1437.

Thornton Cleveleys (TCARS)—4 January ("Aurora", by Alan Bullock, G8MKQ), 11 January ("Maps", by Jerry Vallily), 18 January (Film night), 25 January ("Direction finding", by Dave Starkie, G4AKC), 1 February (An evening with Harry Gregory, G3GIY), 7.30pm. Thornton Cleveleys Sports Centre, Victoria Road, Cleveleys. Sec Mrs J. S. Ward, G8YOK.

Wallasey (St Dunstan's ARS)—Information from E. C. John, G3SEJ, 52 Broadway Avenue, Wallasey, Merseyside L45 6TD.

Warrington (W & DARS)—Tuesdays, 7.45pm. Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Ron Staples, G3MMD, tel Lymm 3533.

Warrington (Racal Communication RS)—Information from sec, c/o Racal Communications Ltd, Chesford Grange, Warrington, Cheshire W81 4RH.

Warrington (10th Warrington Scout Group ARC)—Information from sec, c/o 41 Highfield Avenue, Great Sankey, Warrington, Cheshire WA5 2TW.

Warrington (UK FM Group Western)—7 January, 4 February, 8pm. Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Gordon Adams, G3LEQ, tel 0565 4040.

Wigan (Douglas Valley ARS)—Meetings first and third Thursdays in each month. Shevington Conservative Club, Shevington, Wigan. Details from sec Jack Stephens, G3LRB.

Wigan (WCTARC)—Information from J. R. Hesford, Dept of Electrical Engineering, Wigan College of Technology, Parsons Walk, Wigan WN1 1RR.

Winsford (Mid-Cheshire ARS)—Wednesdays, 7.45pm. St Chads Church Rooms, Gladstone Street, Winsford. Sec Rob Linton, G8XMZ, tel Pickmere 3601.

Wirral (WARS)—The new officers elected at the AGM are: chairman, Garry O'Keefe-Wilson, G4MIA; treasurer, Ken Birch, G2FOS; secretary, Gordon Lee, G3UJX, tel 051-677 1518. First and third Wednesdays in each month, 7.45pm. Minto House School, Birkenhead Road, Hoylake.

Wirral (W&DARC)—Wednesdays, 8pm. Concourse Sports Centre, West Kirby, unless otherwise advised. Sec Ian Brooks, G8PMW, tel 051-639 5666.

Woodford (RATEC)—This new club, founded June 1981, meets on Mondays, 8pm. The British Legion, Moor Lane, Woodford, Cheshire. Its officers are: chairman, David H. de Souza-Kirby, G3VFP, 17 Laleham Green, Bramhall, tel 061-439 2377; treasurer, George Mountney, G8TAZ; secretary, Bob Marsh, G8TYH, tel 061-439 1422. The objects of the club are to promote the technical aspects of amateur radio. RR1 wishes the club every success in the future.

Workington (Anglo-Scottish RP Group)—Information from the sec, c/o 1 Company Fold, Little Clifton, Workington, Cumbria.

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel 094-786 333.

Barnsley (B&DARS)—Mondays, 7.30pm. The Warren, Warren Quarry Lane off Park Road, Barnsley. Activity nights second and fourth in each month. **Note** the new location, which arrived just too late for last month's issue. The October issue of their newsletter shows a full calendar for this fast developing club. Details from G4JKW.

Barnsley (UK FM Group Northern)—7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G8PLJ.

Bradford (UOBARS)—Thursdays, 7.30pm. N10, Main Building. Sec G8GOV. Net frequency 145·275MHz.

Denby Dale (DD&DARS)—Second and fourth Wednesdays in each month, 7.30pm. Pie Hall, Denby Dale. Sec J. Clegg, G3FQH.

Doncaster (DMIoHEARC)—Details from sec Robert Lane, G8VLQ, tel 59747. Club call G3UER.
Goole (G&DARS)—Mondays, 7.30pm. The Grammar School, Boothferry Road, Goole, during school term only. Out of term at the Chamber of Commerce building, Boothferry Road, Goole. Details from chairman, G3VBI.
Halifax (Northern Heights ARS)—7.45pm. Bradshaw Tavern, Bradshaw, Nr Halifax. Sec Richard Harker, 30 Sandbeds, Queensbury, Bradford BD13 1AF, tel Bradford 883802. In the October newsletter is a design for a mobile rig theft alarm.
Harrogate Repeater Group (HRG)—At a recent meeting of the group a full report on progress was made to members. All hardware should be complete by the time this is read, and members will be eagerly awaiting the licence. Further details from G4ATZ.
Hornsea (HARS)—Wednesdays, 8pm. The Mill, Mill House, Attic Road, Hornsea. Sec M. Willby, G4MWE.
Hull (H&DARS)—Fridays, 8pm. RAE classes are held at 9pm, Fridays. West Park Recreation Centre, Walton Street, Hull. Sec G6DUL, 142, Hall Road, Hull HU6 8SB. Tel 0482 447355.
Hull (HUR&ES)—1.15pm, Room 313B, University Union Building, Cottingham Road. Details from G8RPZ.
Leeds (White Rose RS)—8pm. Moortown Rugby Football Club, Moss Valley, Alwoodly, Leeds 17. Club net 8pm Thursdays on 3·7750MHz, or 21·350MHz depending on conditions. Sec G8UYZ, tel 0532 586406.
Leeds (L&DARS)—Mondays, 8pm. Old Hall Golf Club, Woodhall Lane, Calverly, Leeds. Sec Chris Gledhill, G6CNP, tel 0532 56702.
Mexborough (M&DARS)—Fridays, 7pm. Harrop Hall, Dolcliffe Road, Mexborough. Sec G3ZHI, tel Rotherham 814911.
Otley (OR&ES)—Tuesdays, 8pm. Back of Court House Street, Otley. Sec Jack Annakin. Contact G8DFZ for details.
Pontefract (P&DARS)—7 January (AGM), 21 January (Junk sale), 4 February (Construction evening). Preparations are almost complete for the Pontefract Component Fair on 14 March. The club dance, held on 9 October, was a great success, both socially and financially, raising over £150, and will certainly be included in next year's programme. Details from G4ISU.
Scarborough (SARS)—Mondays, 7.30pm. Scarborough Cricket Club, North Marine Road, Scarborough. Sec G4JAQ, tel Scarborough 862638. 1982 is the 50th anniversary of Scarborough ARS, and the year is to be marked with a number of special events. Details of the Scarborough Award appear in this month's MOTA, and further details may be obtained from the sec.
Sheffield (SARS)—Third Monday in each month, 8pm. Sheaf House Hotel, Bramell Lane, Sheffield. Sec G4APV, 321 Fulwood Road, Sheffield S10.
Sheffield (British Steel ARS)—Wednesdays, 7.30pm. Tinsley Sports & Social Club, Bawtry Road, Sheffield. Details from G3XSI, tel Sheffield 51417.
Wakefield (W&DARS)—12 January ("Crime prevention", by local CPO), 26 January (Junk sale), 9 February ("23cm and 70cm", by G3HCW), 23 February (Natter night), 8pm. Holmfield House, Denby Dale Road, Wakefield. Sec G4BLT, tel Wakefield 255515.
Wharfdale Repeater Group—Sec G3KKP.
York (YARS)—Fridays, 7.30pm except the third in each month. United Services Club, Micklegate, York. Sec Keith Cass, G3WVO. The annual dinner was a great success, with president G3TMN calling for relaxation of licensing conditions in his address. The committee key was presented to G4LHB and G4MIY, while the president's trophy went to John, BRS33736.

REGION 3—Acting RR H. S. Pinchin, G3VPE, 61 Cole Bank Road, Hall Green, Birmingham B28 8EZ. Tel 021-777 1320.

Atherstone (AARC)—Second Thursday in each month (Talk, demonstration, visit, etc), third Thursday in each month (Informal), 7.30pm. The Tudor Centre, Coleshill Road, Atherstone. Sec G8SYE, tel Atherstone (08277) 5995.
Birmingham (Midland ARS)—19 January, 8pm. 294a Broad Street, Birmingham B1 2DS. Sec G8BHE, tel 021-422 9787.
Birmingham (Slade RS)—First Friday in each month, 7.45pm. The Kingsbury Road, Community Centre, 75 Kingsbury Road, Erdington, Birmingham B24 8QH. Sec G4FGF, tel 021-770 3474.
Birmingham (South Birmingham RS)—Thursdays (HF night on the air), Fridays (Construction and morse classes), 7.30pm. 3 February (Surplus sale), 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G4GZI, tel 021-427 7104.
Birmingham (UoAston ARS)—Informal meetings Mondays and Fridays during term, 1pm. Sumpner common room. RAE and morse classes available. Chairman G4GJL, sec G8ZEZ, c/o Electrical Engineering Department.
Birmingham (UoBARS)—Fridays during term, 7.30pm. Tuesdays (RAE classes), 7.30pm. Club room gatherings every lunchtime during term, second floor Students' Union (above shop). Sec Dave Thomas, G4HHJ.
Bromsgrove (B&DARC)—8 January, 22 January (QRP group meeting), 26 January (Informal at Parkgate Inn), 8pm. Avoncroft Art Centre, Bromsgrove. Club net Wednesdays, 144·850MHz, 8pm. Morse classes available. Sec G4HFP, tel Stourport (02993) 3818.
Burton-on-Trent (B-o-T&DARS)—Wednesdays, 8pm. Stapenhill Institute, Main Street, Stapenhill, Burton-on-Trent. Sec G3ACR.
Cannock Chase (CCARS)—The club meets Thursdays, 8pm. Bridgtown War Memorial Club, Union Street, Bridgtown, Cannock. The G3ABG Trophy, in memory of the late John Morris, has been presented to Larry Arkley, G4HMV. It is awarded to the person who has done the most for the club in the previous year. This admirable trophy was made and presented to the club by Mick Roney, G4FYP. Sec G8HZP, tel Cheslyn Hay (0922) 416419.
Coventry (CARS)—8 January (Night on the air), 15 January (Annual dinner), 22 January (Night on the air), 29 January (Talk on Raynet), 8pm. Baden Powell House, 121 St Nicholas Street, Radford, Coventry. Sec G4HRY, tel Coventry (0203) 618648.
Coventry (CTCARS)—Mondays, 7pm. Winfray Annexe of the college. Sec G8ISJ. All visitors welcome.
Dudley (DARC)—Second and fourth Tuesdays in each month, 7.45pm. Central Library, Dudley. Sec Norman Rock, 28 Conway Close, High Acres, Kingswinford, Brierley Hill DY6 8PT.
Hereford (HARS)—First and third Friday in each month, 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY, tel Hereford (0432) 3237.
Kidderminster (K&DARC)—Alternate Tuesdays, 8pm. Aggborough Community Centre, Hoo Road, Kidderminster. Sec G8WOX, tel Kidderminster (0562) 61584.
Lichfield (Chad RC)—Alternate Wednesdays, 8pm. The Naval Club, Burton Old Road, Lichfield. Sec G4ESK.
Malvern Hills (MHRAC)—12 January ("From transistor to microprocessor", by Simon Brown, G4ATU), 7.30pm. The Red Lion Inn, St Ann's Road, Great Malvern. Sec G4BVY, 9 Wyche Road, Malvern, tel Malvern (06845) 62900.
Much Wenlock (Wenlock ARES)—Second and fourth Wednesday in each month, 8.30pm. Raven Hotel club room, Much Wenlock. Sec Denzil Jones, RS48112, Shasta, 12 Portland Drive, Walton Hills, Much Wenlock, Salop TF13 6EY, tel Much Wenlock (0952) 727269.
Redditch (RRC)—14 January ("Aerials and feeders", by Dave Yates, G3PGQ), 28 January (Informal meeting), 8pm. WRVS Centre, Ludlow Road, Redditch. Sec G3EVT, tel Alcester (0789) 762041.
Rugby (RATS)—Wednesdays, 7.30pm. Cricket pavilion entrance to B Building, Rugby Radio Station, A5 trunk road, Hillmorton, Rugby. Sec G4ECO.
Shrewsbury (Salop ARS)—7 January (Natter night), 8 January (Dinner dance at Wroxeter Country Club), 14 January ("Components", by John Hartley, G8AEV), 21 January (Natter night), 28 January ("The hot stuff", by Brian Wilde, G3VWH), 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G6AKE, tel Shrewsbury (0743) 66969.
Solihull (SARS)—19 January (Surplus sale), 7.30pm. The Manor House, High Street, Solihull. Club nets (G3GEI), Fridays, 9.30pm on 1,960kHz & (G8ZLJ), Sundays, 9pm on S19 or next lowest vacant channel. Morse classes available. Sec G4JDL.
Stafford (North Staffs Poly ARS)—Wednesdays during term, 2pm. Lab D2. Sec G. S. Yemm.
Stoke-on-Trent (North Staffs ARS)—First and third Mondays in each month (Lectures, etc), other Mondays (Natter nights, Raynet and club station, G4BEM), 7.30pm. Harold Clowes Community Centre, off Dawlish Road, Bentilee, Stoke-on-Trent. Sec G8FGR, 61 Westacre, Bucknall, Stoke-on-Trent ST1 6AF.
Stoke-on-Trent (S-o-TARS)—Thursdays, 7.30pm. 2a Racecourse Road, Oakhill, Stoke-on-Trent. Sec G4IMV, tel Newcastle (0782) 613207.
Stourbridge (StARS)—18 January (Construction contest), 7.45pm. Library, Longlands School, Brook Street, Stourbridge. Sec G8JTL, tel Lye (038482) 4019.
Stratford-upon-Avon (S-u-A&DARC)—11 January (Talk on curing interference), 25 January (Activity night), 7.30pm. Bearley radio station. Talk-in on S22. Acting sec G8OVC, tel Stratford (0789) 750584.
Sutton Coldfield (SCRS)—Second and fourth Monday in each month, 7.30pm. Central Library, Sutton Coldfield. Club net Mondays, except on meeting nights, 145·2MHz, 8pm. Sec G8TUR, tel 021-353 2061.
Tamworth (TARS)—Second Monday in each month (Formal meeting), 8pm. Riverside Meeting Rooms, Lichfield Street, Tamworth. Other Mondays (Informal), Club shack, Whitacre Heath, near Kingsbury. Club net Wednesdays, 145·375MHz, 9pm. Sec G4BKA, tel Tamworth (0827) 283952.
Telford (T&DARS)—Wednesdays, 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel Telford (0952) 584173.
Walsall (WARC)—Alternate Wednesdays, 8pm. Forest Comprehensive School, Bloxwich. Club net Fridays 3·70MHz ssb, 9pm. Sec G4GKC, tel Walsall (0922) 39457.
Warwick (Mid-Warwickshire ARS)—First and third Tuesdays in each month, 8pm. 61 Emscote Road, Warwick. Club net Mondays on non-meeting days, 145·350MHz, 8pm. Sec G8RZR, tel Warwick (0926) 499730.
Willenhall (W&DARS)—Alternate Wednesdays, 8pm. Saracens Head, Bloxwich Road South, Willenhall. Sec G4FAQ, tel Wolverhampton (0902) 730300.
Wolverhampton (WARS)—Mondays, 8pm. Wolverhampton Chamber of Commerce & Industry, 93 Tettenhall Road, Wolverhampton WV3 9PE. Sec G8EDG, tel Wolverhampton (0902) 763617.
Worcester (W&DARC)—1 February ("TVI", by Alan Pidgeon), 8pm. "Old Pheasant", New Street, Worcester. Sec G8TZE, tel Tewkesbury (0684) 293890.

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.

Bolsover (BARS)—Wednesdays, 8pm. The Angel, Bolsover. Sec David Brocklehurst, G8KIF, 33 Chestnut Drive, Clowne, Chesterfield, Derbyshire, tel 0246 811666.
Derby (D&DARS)—6 January (Junk sale), 13 January (Film show), 20 January (Visit), 27 January (Night on the air), 3 February (Junk sale), 7.30pm. Morse classes Tuesdays, 7pm. Vintage radio section third Friday in each month, 7.30pm. Club Room, top floor, 119 Green Lane. Sec Jenny Shardlow, G4EYM, tel Derby 556875.
Derby (Nunsfield House ARG)—Fridays, 7.45pm. Nunsfield House, Boulton Lane, Alvaston, Derby. Sec Ian Cage, G4CTZ, tel Derby 799452/71875.
Grimsby (GARS)—Alternate Mondays, 7.30pm. Cromwell Social Club, Grimsby. Sec Trevor Matthews, G3RGC, tel Grimsby 884060.
Heanor (South East Derbyshire ARS)—Tuesdays, 7.30pm. South East Derbyshire College, Ilkeston Road, Heanor. Information from T. Clarke, G8RZN, tel Langley Mill 64813.
Hinckley (HAR&ES)—Wednesdays, 7.30pm. John Cleveland College, Butt Lane, Hinckley. Sec Norman Geary, G8STX, tel Hinckley 632778.
Ibstock (IARS)—Tuesdays, 7.30pm. Hastings Arms, Ibstock. Sec Steve Haywood, G8UZQ, tel Ibstock 62158.
Leicester (LRS)—Mondays, 7.30pm. Sundays, 10.30am. Gilroes Estate Cottage, off Groby Road, Leicester. Sec Paul Elliott, G4MQS (ex-G8XGD).
Leicester Repeater Group—Information from Geoff Dover, G4AFJ.
Lincoln (LSWC)—Second and fourth Wednesday in

The RSGB President, Basil O'Brien, G2AMV, met a bus party from the Scunthorpe club at the Leicester exhibition, and is seen here with Terry, G4CBY. *Photo*: G6BWU

each month, 7.30pm. City Engineers Sports & Social Club, Waterside South, Lincoln. Sec Chris Jones, G6AJL.

Loughborough (LFARC)—Fridays, 8pm. Brush Sports & Social Club, Fennel Street, Loughborough. Information from G8BUB, tel Shepshed 3558.

Louth (L&DARS)—13 January, 7.30pm. Pleasant Place, Eastgate, Louth. Sec Ron Padbury, G4GAB.

Mansfield (MARS)—1 January (Contests), 18 January (Club meeting), 7.30pm. New Inn, West Gate, Mansfield. Sec John Coates, G4GYU, tel Mansfield 27257.

Matlock (Derwent Valley ARS)—First Monday in each month, 8pm. Chatsworth House, Matlock Training College, Chesterfield Road, Matlock. Sec Bob Burbeck, G8ELN.

Melton Mowbray (MMARS)—15 January ("VHF dx", by G8RBY), 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK, tel Melton Mowbray 63369.

Nottingham (ARCON)—7 January (Forum), 14 January (Talk, tba), 21 January (Activity night), 28 January (Computer forum), 7.30pm. Sherwood Community Association, Woodthorpe House, Mansfield Road, Nottingham. Sec Mike Shaw, G4EKW.

Scunthorpe (SARC)—3 January ("Nascom 11", by G4GZA and G8GIH), 12 January (70cm, G4HZN), 19 January ("Aerials for new bands", by G3PDL), 26 January (NFD and other contests, a discussion), 2 February ("CW contests", by G3TMC), 7.30pm. Thursdays (RAE classes), 7.30pm. (Morse classes) 9pm. Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe. Sec Joe Sheardown, G8TIY, tel Scunthorpe 732438.

Skegness (S&DARS)—First and third Tuesdays in each month, 8pm. The White Swan, Burgh-le-Marsh, Skegness. RAE classes 7pm, Mondays. Sec Jack Joslin, G3NPY, tel Skegness 4287.

Spalding (S&DARC)—First Friday in each month, 7.30pm. Maple Room, White Hart, Market Place, Spalding. Information from Denis Hoult, G4OO, tel Risegate (077586) 382.

Wigston (WRC)—Fridays, 5 February (Bring & buy), 7.30pm. United Reform Church, Wigston, Leicester. Sec Tim Riggott, G4MFU, tel Leicester 712570.

REGION 5—RR J. S. Allen, G3DOT, 77 Rosslyn Crescent, Luton, Beds LU3 2AT.

Bedford (B&DARC)—Wednesdays, 8pm. Club shack, Ravensden, Bedford. Sec G4JTJ.

Cambridge (C&DARC)—Fridays, 8 January (Broadcast transmitters), 15 January (Informal and morse class), 22 January (Curry evening—details to follow), 29 January (Informal and morse class), 5 February ("Sporadic-E and long-distance tv", by John Worsnop), 12 February (Informal and morse class), 19 February ("Television systems", by Chris Rowsell), 7.30pm. Coleridge Community Centre, Radegund Road, Cambridge. Sec G8JKV.

Corby (CARG)—Fridays, 7.30pm 104 Mallows Drive, Raunds, Wellingborough, Northants. Sec G8MLA.

Dunstable (DDRC)—Fridays, 8pm. Chews House, High Street South, Dunstable, Beds. Sec G4ENB, chairman G3WLM.

Leighton Buzzard (LLRC)—Twice monthly, 7pm. Vandyke Community College, Room A64. Sec G8GIK. Morse classes at 1915, lectures at 2000. Talk-in to club QTH on 145·275MHz.

Luton (Kent Process Controls Ltd ARC)—First Wednesday in each month, 8pm. KPC Ltd Sports Club, Tenby Drive, Luton. Sec G3DOT, chairman G3TLE. All licensed amateurs and swls in the Brown Boveri Company and Brown Boveri Kent Companies are welcome to attend.

March (M&DRAS)—Tuesdays, 7.30pm. 2 Cray's Lane, March, Cambridgeshire. Sec G8GNE.

Northampton (NRC)—Thursdays, 8pm. 6 Stowlea Road, Sywell, Northampton.

Peterborough (PR&ES)—Fourth Thursday in each month. Sec G3EEL.

St Neots (SN&DARS)—3 January (New Year fox hunt. Start 1000 on S9 (145·225MHz) with G4MHN as the fox), 4 January (Informal). Sec G4FOH, chairman G8GRT, Vice-chairman G8YCI, treasurer G4MHN. Meetings fortnightly.

Shefford (S&DARS)—Thursdays, 8pm. Sec G4DAQ. The Shefford net meets at 7pm daily, on 1910kHz ssb.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA. Tel Penn (049481) 4240.

Aylesbury Vale (AVRS)—26 January (AGM), 8pm. Elmhurst Youth Centre, Fairfax Crescent. Details from G8BQH, tel 0296 64783.

Burnham Beeches (BBRC)—First and third Mondays in each month. St John's Ambulance HQ, Burlington Road, Nr Chalvey, Slough, Berks. Details from David Avers, tel Maidenhead 28108.

The St Andrews Scouts operating from G2DRT during JOTA 1981

Chesham (C&DARS)—28 January (Talk on Raynet by Steve Grove, G4BSM), 8.30pm. The Whitehill Centre. Details from sec G8PUC, tel 0494 785625.

High Wycombe (Chiltern ARS)—27 January (AGM, members please attend). John Hawkins Ltd Canteen, Victoria Street. Tel High Wycombe 24095.

Maidenhead (M&DARS)—Sec J. Patrick, G3TWG, tel Bourne End (06285) 25275.

Newbury (N&DARS)—12 January ("Radio interference", by Don Franklin of BT), 9 February (Visit to an amateur's shack). Details from sec Merton Vaslet, G4JAL, tel Newbury (0635) 46078.

Oxford (O&DARS)—Please contact Stuart Wilkins, G3HMJ, for meeting details.

Oxford (OURS)—Contact G4KGA, Oriel College for meeting details.

Reading (RARC)—Details from sec Chris Young, G4CCC.

Vale of the White Horse (VWHSARS)—5 January ("Simple hf antennas", by Ted Wake, G5RP), 2 February ("Yagi aerials, fact and fancy", by Ian White). All meetings 8pm. Details from G4FLX, tel Wallingford 37482, or G3SEK, tel Didcot 812584.

REGION 7—RR Pat Walker, G8HMG, 12 Brownlow Road, Redhill, Surrey RH1 6AW. Tel Redhill 64035, evenings, 01-834 9070, daytime.

Addiscombe (AARC)—Tuesdays, 9pm. The Woolpack, 154 Gloucester Raod, Selhurst, Croydon. Sec Peter Hart, G3SJX, tel 01-656 9054.

Ashford (Echelford ARS)—Second Monday and last Thursday in each month, 8pm. The Hall, St Martin's Court, Kingston Crescent, Ashford, Middlesex. Sec G8LEL, tel Byfleet 46847.

Bexleyheath (North Kent RS)—First and third Tuesday in each month, 8pm. The Pop-In Parlour, Graham Road, Bexleyheath. Sec Pelham Conduit, G4KCZ. Tel Crayford 524096.

Brixton (Ferndale RS)—Wednesdays 6.30pm. Brixton College, Ferndale Road, London SW4. Sec G4GTO, tel 01-660 2532.

Coulsdon (CATS)—Sec A. R. Bartle, G6HC, tel 01-684 0610.

Cray Valley (CVRS)—First and third Thursdays in each month, 8pm. 28 January ("Outside broadcast TV", by G3FWI (NB fourth Thursday)). Christchurch Centre Hall, Eltham High Street, Eltham SE9. Sec G4FUG.

Croydon (Surrey Radio Contact Club)—First and third Wednesdays in each month, 7.30pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec G4FFY. Tel 01-642 9871.

Crystal Palace (CP&DRS)—Third Saturday in each month, 8pm. Emmanuel Church Hall, Barry Road, London SE22. Sec G3FZL.

Guildford (G&DRS)—Second and fourth Friday in each month, 8 January (Party night), 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec Helen Davies, G8SXB, tel Aldershot 20384.

Kingston (K&DARS)—Third Wednesday in each month, 8pm. "Alfriston", 3 Berrylands Road, Surbiton. Sec Robin Pellatt, G4LJI, tel 01-399 8113.

New Cross (Clifton ARS)—Fridays, 15 January (Contest discussion) 8pm. Upstairs room, New Cross Inn, Clifton Rise, London SE14. Details from Reg Hinton, 42 Sutcliffe Road, Welling, Kent.

Redhill (Reigate ATS)—Third Tuesday in each month, 8pm. Constitutional & Conservative Centre, Warwick Road, Redhill. Sec Chris Barnes, G8FEE, 25 Hartswood Avenue, Woodhatch, Reigate RH2 8ET.

Sutton & Cheam (S&CRS)—Sec G. W. Brind, G4CMU, tel Burgh Heath 54497.

Thames Ditton (Thames Valley ARTS)—First Tuesday in each month, 5 January ("Visit to Russia", by Peter Matthews, G3FTR), 8pm. Giggs Hill Green Library, Giggs Hill Road, Thames Ditton. Sec Malcolm Bell, G8RLB, tel 01-977 6122.

Tolworth (Decca ARG)—First Thursday in each month, 8pm. Decca Sports & Social Club, Kingston Road, Tolworth. Sec G3NFV, tel Leatherhead 72587.

Wimbledon (W&DRS)—Second and last Friday in each month, 8pm. St John Ambulance Hall, Kingston Road, Wimbledon SW19. Sec E. G. Allen, G3DRN, tel 01-947 3914.

Would club secretaries please let RR7 have details of programmes and activities by the date shown at the beginning of the "Club news" section.

REGION 8—RR K. A. Crouch, G8KEN, 14 Victoria Road, Capel-le-Ferne, Folkestone, Kent CT18 7LR. Tel 0303 55241.

Brighton (B&DRS)—Second Wednesday in each month, 13 January (TV night (Amateur tv or show), G6AIW and G8XEU), 27 January (RSGB night), 7.45pm. 47 Cromwell Road, Hove. Details from G4GNX.

Burgess Hill (Mid-Sussex ARS)—Alternate Thursdays, 14 January (TBA), 28 January (AGM), 7.30pm. Marle Place, Leylands Road, Burgess Hill. Details from Jack Brooker, G3JMB, tel Hassocks 4965.

Canterbury (EKRS)—7 January (Junk sale (recorded to be the best in Kent)). Further details from Derek, G8ELS, tel Herne Bay 5629.

Chichester (C&DARC)—First and third Mondays in each month, 7.30pm. Spitfire Social Club, Tangmere. Details of events in the future from S. Talbot, G8FCX, tel Littlehampton 5082.

Crawley (CARC)—All information from D. L. Hill, G4IQM, tel 0293 882641.

Dartford (DHDFC)—Details of club events given on club net, 1,930kHz, Sundays, 10.30am, and Tuesdays, 145·325 (S13). Please check with G4FYV for start details before every meet. Further information from Alan Birchmore, G4BWV.

Dover (South-East Kent YMCAARC)—Wednesdays, 6 January (Natter night), 13 January (Coastguards talk), 20 January (10 minute talks by four club volunteers), 27 January (Special guest lecturer, tba), 7.30 for 8pm. Morse practice, 7pm. Club is open every evening by arrangement with G4EGQ. Further information from G8KEN, or G3VSU.

Eastbourne (Southdown ARS)—First Monday in each month. Details from R. Jefferies, G8KQN or pro, G3LFZ.

Gravesend (GRS)—Mondays, 7.30pm. Windmill

Tavern, Shrubbery Road, Gravesend. Details from F Donavan, G4ALD.

Hastings (HERC)—Wednesdays, 7.30pm. First in each month (Committee meets), second, fourth and fifth in each month (Micro nights), 479 Bexhill Road. Third Wednesday in each month (Main meeting), 20 January ("Meteor scatter techniques", by G4DEZ). West Hill Community Centre. Further details from programme sec Alan Beecher, G8VEA, tel Hastings 216516.

Horsham (HARC)—First Thursday in each month. Parish Rooms, The Causeway, Horsham. Details from A. C. Wadswirth, G3NPF.

Kent Repeater Group—The group is responsible for GB3KS (Dover), GB3KN (mid-Kent) on 144MHz, and GB3CK (Charing), GB3EK (Margate), GB3NK (Wrotham) and GB3SK (Folkestone) on 432MHz. Information from G3MDO.

Maidstone (MYMCAARC)—Fridays, 8pm. 11 January ("A presentation", by R. G. Sheers of KW Electronics), 22 January ("The RSGB amateur radio insurance scheme", by Mr Gibson). First and third Fridays (Beginners class), Tuesdays (General question session and morse practice), 8pm. Further details from RSGB Area Rep Graham Edy, G4AXD.

Medway (MARTS)—No 1 Hall, St Luke Church, King Williams Road, Gillingham. Details from G4EVY, tel Medway 76463. The club celebrates its 60th anniversary this year, and has introduced a diamond jubilee award to mark the occasion, details of which may be obtained from G4LHU. There will be a special event station, GB2MDJ, which will be in operation from 21 February to 20 March.

Sussex Repeater Group—The group maintains GB3SR and GB3BP on 144MHz; GB3BR, GB3HO and GB3NX on 432MHz; and GB3WX, GB3CP and GB3HM on 1·3GHz. Details from G4GNX.

Tunbridge Wells (West Kent ARS)—First and third Friday in each month, 8 January ("System X and beyond", by Chris, G8CAA), 22 January (Junk sale), 5 February (HF/VHF Field Day arrangements). Adult Education Centre, Monson Road, Tunbridge Wells. Tuesdays following the Friday meetings (Informal night). The Drill Hall, Victoria Road. Details from G4DYF, tel 0732 56708.

Worthing (W&DARC)—Tuesdays, 7.30 for 8pm. Pond Lane Amenity Centre, Durrington. Further details from sec Joyce Lilly White, 41 Brendon Road, Worthing, tel Worthing 63062.

If your club's information is very small with no details about actual dates it means I have not received up-to-date information. Please send me your club programmes by the dates given with some news on what you have been doing, the callsigns your club holds, or, anything of interest that will attract members or visitors to your club, and I will send it for publication. If you do not send anything your club will not be mentioned until July. Hope to see some of you during 1982.—*RR8.*

REGION 9—RR W. J. Colclough, G3XC, Highview, Indian Queens, St Columb, Cornwall TR9 6LL. Tel 0726 860485.

Camborne (Cornish RAC)—First Thursday in each month, 7 January ("Beetling around Africa", by G3WKP), 7.30pm. SWEB club room, Pool, Camborne. Contact Ron, G2ABC, tel Truro 78393. President, A. H. Hammett, G3VWK; chairman D. W. Blackford, G3NPB; sec A. C. French, G8TUJ; treasurer, L. T. Taylor, G3RMG. Cornish Net, weekdays, 3·714MHz, 10am; Sundays, 144MHz ssb net, 144·275MHz, 10.30am, and 3·692MHz at 11am. Cornish award manager E. Bowden, sae for details. Computer section, third Monday, 18 January (Machine code programming), SWEB Pool. Details from C. Bowden, G3OCB.

Exeter (EARS)—Second Monday in each month, 11 January (Talk on radio propagation by Mr L. Muggleton of the University of Exeter (Part one)), 8 February (Part two), 7.30pm. Community Centre, St Davids Hill, Exeter. First, third and fourth Monday in each month (Informal). The Scout Hall, Emanual Road, Exeter. Contact PRO Geoff Draper, 1 Carlyon Close, Heavitree, Exeter EX1 3AZ. Chairman, Alan Cox, G8TKL; sec, Francis Stower, G6FGS; treasurer, Michael Judd, G8WWX.

Exeter (EUARS)—Sundays during termtime, 2.30pm. Room 225, Applied Science Building, North Park Road, Exeter. Contact Miss Bellchambers, G8ZPJ, Devonshire House, Stocker Road, Exeter EX4 4PZ.

Exmoor (ERC)—Thursdays, 8pm. "Loughrigg", East Street, South Molton, Devon. Contact sec Dave Jones, G6CHZ, 47 Oakford Villas, North Molton, Devon, tel North Molton 377. Club call G8SSS. RTTY section now operational.

Exmouth (EARC)—Alternate Wednesdays, 7.30pm. Rolle College, Exmouth. Contact Mrs J. Nicholson, G8XRR, tel Exmouth 77263.

Newquay (N&DARS)—Alternate Wednesdays, 7.30pm. Treviglas School, Newquay. Chairman, Ted Warne, G3YJX; treasurer, Brian Pearce, G8GOR. Contact Bob Lawrence, G4LDA, 36 Molesworth Road, Wadebridge, Cornwall PL27 6AY, tel Wadebridge 3649.

North Devon (NDARC)—Even months, second Wednesday, 7.45pm. Community College, Abbotsham Road, Bideford, Devon. Odd months second Wednesday, Community College, Pilton, Barnstaple, Devon. Contact George, G4CG, tel Barnstaple 3683. Chairman, Les Hawkyard, G5HD; treasurer, Geoff Beal, G4ELU.

Plymouth (PRC)—Alternate Mondays, 7.30pm. Tamar School, Paradise Road, Millbridge, Plymouth PL1 5QW. President, Steve Rance, G3WL; chairman, Kenneth Huxham, G8MLI; secretary, Ivor Budding, G4GWK; treasurer, Julie Butcher, G4HKZ. Contact PRO Alan Huxham, 73 Winchester Gardens, Whitley, Plymouth, tel 0752 786508.

Plymouth (PPARS)—During term, 12h per day. Contact Jeff Key, G8VTW, ARS Plymouth Polytechnic Students Union, Drakes Circus, Plymouth, Devon.

Saltash (S&DARC)—First and third Fridays, 1 January (G4GXK/G8SAL activity night), 15 January (Quiz night, conducted by Colin Squires, G3XCS), 7.30pm. Toc H, Burraton, Saltash. President, Harry Griffiths, G2DFH; chairman, Dave Bunce, G8VJB; treasurer, Colin Squires, G3XCS. Contact sec Kevin Hale, ARS47699, 12 Rashleigh Avenue, St Stephens, Saltash, Cornwall PL12 4NS.

Torbay (TARS)—Fridays, 7.30pm. Last Saturday in each month, special meeting, 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay, Torbay. President, Les Mays, G2CWR; chairman, Freddy Bolton, G3VTQ; sec H. Davies, G4DZH; treasurer, F. White, G4FLW. Contact PRO Les Mays, G2CWR, tel Paignton 558714. Mondays, Wednesdays and Fridays, 3·5MHz net, 1030, and Saturday 1000, on 3·756MHz. Club annual dinner, Templestone Hotel, Torquay, 13 March. All correspondence to sec Hugh Davies, G4DZH, tel Paignton 523063.

Treverbyn (English China Clay RC)—Alternate Mondays, 4 January (AGM), 18 January ("Ideas for 1982") 7pm. Pentewan Labs, Pentewan Road, St Austell, Cornwall. Contact Jack Redfern, G8HSZ, tel St Austell 3647.

REGION 10—RR P. A. Jones, GW4HAT, 68 Pastoral Way, Tycoch, Swansea SA2 9LY.

Barry (BCoFERS)—Thursdays, 7.30pm. Barry College of Further Education Annexe, Weycock Cross, Barry. New meetings format—first Thursday (Lecture/demonstration), third Thursday (Equipment and accessories sale). It is intended to make space available on each club night for informal demonstrations of equipment. Further details from John Share, GW3OKA, tel 702455.

Blackwood (BARS)—Fridays, 7pm. Oakdale Community Centre, Oakdale, Blackwood, Gwent. Further details from Norman Davies, GW8UCQ, tel Blackwood 227550.

Bridgend (B&DARC)—Second Wednesday in each month, 7.30pm. NCB Social Club, Tondu, Bridgend. Club call GW4LNP, club net 144MHz, S13, Wednesdays. Further information from Peter Lynn, GW8WCI, tel Bridgend 861115.

Cardiff (CRSGBG)—Second Monday in each month, 7.30pm. Pantmawr Inn, Pantmawr Estate, Cardiff. Details from Bill Moss, GW4GWS.

Haverfordwest (H&DARC)—Club existence uncertain. RR10 wishes to contact any member asap.

Loughor (LAR&EC)—Tuesdays fortnightly, 7.30pm. Loughor Scouts Hall, Heol Caetynewydd, off Pengry Road, Loughor. Further details Tim Griffin-Thomas, GW8TYS, tel Gorseinon 893392.

Merthyr (Hoover ARS)—There has recently been interest in re-forming the club after a very "lean" period. Previous members and other interested parties are urged to contact Alan Brown, GW3RNC, 1 Bryony Close, Twyny Rodyn, to enable local discussions to take place.

Montgomery (Powys ARC)—Thursdays, 7.30pm. The Cricket Pavilion, Montgomery. Club call GW4HVN. Club details from Mike Smith, GW4DWX, tel Welshpool 2068.

Newport (NARS)—Mondays, 7pm. Brynglas House, Brynglas Road, Newport. Club call GW4EZW. Details from Barry Green, GW4HYZ.

Pembroke (PRSGBG)—Last Friday in each month, 7.30pm. The Defensible Barracks, Pembroke Dock. Further details from Martin Shelley, GW3XJQ, "Sunray", Pendine, Dyfed SA33 4PD.

Port Talbot (British Steel Corporation ARS)—Thursdays, 7.30pm. BSC Sports & Social Club, Margam. The Christmas social had regrettably been cancelled due to circumstances beyond the club's control but arrangements are being made to organize a social event this month. Further information from Reg Bray, GW4ESV.

Rhondda (RARS)—Every other Thursday, 7.20pm. New venue National Union of Mineworkers Club, Tonypandy. Further details from Cyril Parry, GW3PHH, tel Porth 676655.

The Mayor of Swansea (Councillor Paul Valerio, GW4KTT) and Mayoress Mrs Dorothy Valerio invited many local licensed amateurs to a buffet evening at the Mansion House, Swansea on 10 November 1981. It was an event not to be missed, as a record-breaking 110 amateurs and wives/girlfriends accepted the invitations with the greatest of pleasure. The meal was of the highest order and the evening was enjoyed by all and will be remembered for many years hence. Members were present from Swansea, Port Talbot, Loughor and West Wales. Councillor Paul Valerio has given widespread publicity to amateur radio in his official capacity as Mayor of Swansea in recent months,and he was greatly honoured in October to meet Their Royal Highnesses The Prince and Princess of Wales. He was present when it was announced that Swansea was to be honoured with Lord Mayor status, and Councillor Valerio may become the first radio amateur Lord Mayor. All members who attended the buffet evening express through *Radio Communication* their deepest gratitude for such an excellent evening to the Mayor and Mayoress of Swansea seen here with RR10. *Photo:* GW8IMC

Swansea (SARS)—First and third Thursday in each month, 7.30pm. The club will be running a special event station, GB4SWN, from The Swansea Bay Microelectronics Exhibition, Leisure Centre, Swansea, on 6, 7, 8, 9 January. The meetings are held in Lecture room 'N', Applied Sciences Block, Swansea University College. Club net each Sunday, 1030gmt, cw practice 28·300, 1100gmt, phone, 28·530 ±QRM. Net controller Cen, GW4BIQ, all other licensed stations in the locality are welcome to call in. Further information from Roger Williams, GW4HSH, tel 404422.

West Wales Repeater Group (GB3WW)—Subscriptions are now due. Those users of the repeater who are not already members of the group are urged to join to enable the equipment to remain at its present location. The present accommodation is uncertain and in the near future the group will have to pay for permanent premises if it is to remain at this superior site. Your support is vital. Details from Steve Bleaney, GW3VPL, tel Briton Ferry 812361.

If your club's new details are not included above please request your secretary to send me details before the date given at the beginning of "Club News".—*RR10.*

REGION 11—RR B. H. Green, GW2FLZ, 1 Clwyd Court, Tan-y-Bryn Road, Colwyn Bay, Clwyd LL28 4AH. Tel 0492 49288.

Bangor (University College of North Wales ARS)—The Rockets Room, Room 261, School of Electronic Engineering Science, Dean Street. Sec I. Wylie, G6CCJ, Room B402, Neuadd Emrys Evans, Menai Avenue, Bangor, Gwynedd.

Colwyn Bay (Conwy Valley ARC) (GW6TM)—Second Thursday in each month, 7.30pm. 7 January (Annual club dinner), 7pm. Green Lawns Hotel, Bay View Road, Colwyn Bay. Sec J. N. Wright, GW4KGI, tel 0745 823674.

Dolgellau (Meirion ARS)—First Thursday in each month. Ship Hotel, Dolgellau. Sec Mrs Jean Jones, GW4KYK, tel 0654 710402.

Rhyl (R&DARC)—Second and fourth Thursday in each month. Ambulance Station, Rhyl. Sec B. Jones, GW8OYT, 6 Rhodfa Maes Hir, Rhyl, Clwyd, tel 0745 37284.

Towyn (T&DARC)—Details from sec GW4KYK, tel 0654 710402.

Would all club secs in this region please send details of their clubs and their activities to RR11.

REGION 12—New RR to be appointed

Aberdeen (ARS)—Fridays, 7.30pm. The club have now moved into their new clubrooms at 35 Thistle Lane, Aberdeen (at the rear of 35 Victoria Street), which is near to Holburn Junction. The clubroom is a converted scout hut which is on an eight-year lease to the club. On 6 November a cheese & wine party was held in conjunction with the Grampian Amateur Computer Society which attracted about 60 members and friends. The 1982 committee is as follows: president, GM4GXD; vice-president, GM3VEY; sec/treasurer, GM4BKV; committee, GM3GQH, GM4HLQ, GM4JLY, and swl Bill Wilson. The club invites all interested licensed radio amateurs and swls to join the club and help make the new clubhouse successful. A full programme is being arranged. Details from sec GM4BKV.

Dundee (Kingsway TC ARC)—Tuesdays, 6.30pm. Electrical Laboratory, Kingsway Technical College, Old Glamis Road, Dundee. The club is currently planning to renew its vhf equipment to enable it to compete in the various vhf competitions held each year. Details of future activities from sec GM4JCY.

Elgin (Moray Firth RS)—No details of meetings or club officials notified. Last club sec notified as GM8YMY.

Invergordon (Easter Ross RC)—Wednesdays, 7.30pm. 100 High Street, Invergordon. The club callsign is GM4MFL. The club run RAE and morse classes. Details of programme from GM4DKL.

Kirkwall—Members meet on a few occasions each year. Plans are being made for the possible provision of a vhf repeater to cover the Orkney and Caithness area. Details from GM3IBU.

Perth (P&DARG)—Tuesdays, 8-11pm. Perth City Sports & Social Club, Leonard Street, Perth. The club are running a very well-attended RAE class at the club premises. Persons interested in joining are invited along to meet with the members. Annual membership fee is £5. The premises are licensed for the sale of alcohol. A full programme is being arranged for 1982. Details from sec GM8RYZ.

Shetland (Lerwick RC)—Wednesdays, 7pm. Isleburgh House Community Centre, Lerwick. Members can use the club premises at other times as required. Details from sec GM4BBI.

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkaldy, Fife KY1 2LH. Tel Kirkaldy (0592) 200335.

Berwick-upon-Tweed (B&DARS)—First and third Fridays in each month, 7.30pm. Details from GM8YPI, tel Eyemouth 50492.

Borders Repeater Group—The group administers the two 144MHz repeater projects, GB3BT (Berwick-upon-Tweed), and GB3SB (Scottish Borders). Meetings are held in Kelso as and when necessary. Details, GM4CXP, tel St Boswells 2795, or G3HDT, tel Berwick-upon-Tweed 88260.

Dalgety Bay (Marconi Space & Defence Systems ARC)—Details from GM4HBG, tel Glenrothes 771057.

Dunfermline (DARS)—Second Wednesday in each month, 7.30pm. CCTV Studio, Pittencrieff School, Maitland Street, Dunfermline. Details from GM3CIG.

Edinburgh (E&DARC)—Tuesdays, 7.30pm. City Observatory, Calton Hill, Edinburgh. Details from GM3RFQ.

Edinburgh (Ferranti Recreation Club AR Section)—Membership is restricted to company personnel. Details from GM8JKG, tel 031-441 5684. Visits by other clubs by prior arrangement.

Edinburgh (GB3ED Repeater Group)—Details, GM3GBX, tel 031-447 2611.

Edinburgh (Heriot Watt UARC)—Wednesdays, 2.30pm. Mountbatten Buildings, 31-35 Grassmarket, Edinburgh. Details, GM4JFS, tel 031-339 1104.

Edinburgh (Leith Nautical College ARC)—First and third Thursdays in each month, 7.30pm. Leith Nautical College, 24 Milton Road East, Edinburgh 15.

Edinburgh (Lothians RS)—Details from GM8BJF, tel 031-447 5527.

Glenrothes (G&DARC)—Wednesdays and third Sunday in each month, 7.30pm. Clubroom, Provosts Land, Leslie, Fife. Details from GM4AQO, tel Kirkcaldy 266287.

St Andrews (UoStAR&ES)—Details from Physics Department, North Haugh, St Andrews.

Updated information from all clubs would be welcomed by the RR, also any news of club activities either past or future for insertion in this column. A happy and prosperous New Year to all in Region 13.—*RR13*

REGION 14—RR V. J. Kusin, 109 Weymouth Drive, Glasgow. Tel 041-334 2472.

Ayr (AARG)—Two Sundays in each month, normally second and fourth, 7.30pm. Community Centre, Wellington Square, Ayr. Details from sec GM3THI.

Dumfries (D&GREC)—First and third Monday in each month, 7.30pm. Cargenholm Hotel, Dumfries. Details from sec GM4JAP.

Falkirk (Stirlingshire ARG)—Details from sec GM4DGT.

Glasgow (West of Scotland ARS)—Fridays, 7.30pm. 22 Robertson Street, Glasgow. Lectures, chat nights and cw classes. Details from GM4JDU.

Greenock (G&DARC)—Tuesdays and Fridays, 7.30pm. 22 Inverkip Street, Greenock. Details from GM3XNJ.

Helensburgh (HARC)—First and third Wednesdays in each month, 7.30pm. Clyde Street School, Helensburgh. Details from GM6ALC.

Kilmarnock (K&LARC)—First and third Tuesday in each month, 7.30pm. The Buchanan Centre, Riccarton, Kilmarnock. Details from sec GM3ZRT.

Motherwell (Mid-Lanark ARC)—Fridays, 7.30pm. Wrangholm Hall Community Centre, Jerviston Street, Motherwell. RAE classes. Details from GM3ULP.

Stevenson (Ardeer ARC)—Thursdays, 7.30pm. Ardeer Recreation Club, Stevenson. Details from GM3XNE.

Stranraer (SARC)—Fourth Thursday in each month, 7.30pm. Stranraer Community Centre, Lewis Street. Details from sec GM8RUG.

REGION 15—RR J. T. Barnes, GI3USS, Whitegables, 95 Crawfordsburn Road, Bangor, Co Down BT19 1BJ. Tel 0247 3948.

Following information is latest received.

Ballyclare (East Antrim ARC)—12 January (Mobile clinic, bring your rig and see how it performs), 7.30 for 8pm. Carntall Hall, Carntall Road, Mossley. AR GI4KKA. Sec GI4JXM.

Ballymena (BRC)—Thursdays (Club night), 8pm. Mondays (Morse and RAE classes), 7.30pm. 70 Nursery Road, Gracehill. Sec GI4HCN.

Banbridge (Mid-Ulster ARS)—First Sunday in each month, 8pm. QTH of GI4BAC. Lectures are being arranged to cover all aspects of amateur radio including antennas, Raynet, advances in commercial radio communications, hi-fi, fast scan tv, etc. Details from sec GI8XQO, tel Craigavon 42620.

Bangor (B&DARS)—8 January (Note change of date), 8pm. Sands Hotel, Seacliff Road, Bangor. AR GI3TLT, NOT QTHR. Sec GI4JTF.

Belfast (BRSGBG)—Third Wednesday in each month, 8pm, 90 Belmont Road. Varied programme being arranged. Details from AR, GI4IDX.

Belfast (CoBYMRC)—Tuesdays, 7pm; Saturdays, 2.30pm. 12 Wellington Place, Belfast. Sec Paul McTaggart, 14 Thirlmere Gardens, Belfast BT15 5EF.

Belfast (Queen's UoBRC)—Tuesdays during term, 7pm. Morse and RAE tuition available. 37 Fitzwilliam Street, Belfast.

Coleraine (C&DARS)—Fridays, 8pm. QTH of secretary, GI8RPI.

Coleraine (NWARS)—First and third Thursdays in each month, 8pm. BRCS Rooms, New Row, Coleraine, AR GI4HVI. Sec GI4LNJ.

Jordanstown (Ulster College ARC)—GI4FZU. Enquiries to Students Union, Block 11, NI Polytechnic, Jordanstown.

Lisburn (Lagan Valley ARS)—Second Monday in each month, 7.30pm. Rathvarna Teachers Centre, Pond Park Road, Lisburn. AR GI8YTH. Sec GI8SXN.

Londonderry (North West of Ireland ARS)—First Monday in each month, 7.30pm. Templemore School, Londonderry. AR GI3GGY. Sec GI6DBN.

Magherafelt (MARS)—First Tuesday in each month. 12 Garden Street, Magherafelt. Sec GI8JNP.

North Ulster (NURSGBG)—Details from area representative, GI4HVI, QTHR.

Omagh (West Ulster ARC)—Second Monday in each month. McAleers, Campsie, Omagh. Sec GI8TVK.

REGION 16—RR T. D. Howe, G3PLF, 18 Vange Hill Drive, Vange, Basildon, Essex. Tel Basildon 24453.

Braintree (B&DARS)—First Monday in each month (Informal), 8pm. Third Monday in each month (Formal), 7.45pm. Braintree Community Centre, Victoria Street. Details from Alan Williams, G6CIV, tel Silver End 83516.

Bury St Edmunds (BStERS)—Third Tuesday in each month, 7.30pm. Red Cross Headquarters, Mustow House, Eastgate Street. Details from John Munro, 29 Angel Hill, Bury St Edmunds.

Chelmsford (CARS)—First Tuesday in each month, 7.30pm. Marconi College, Arbour Lane. 5 January (Film show), 2 February (Black box evening). Details from Andrew Mead, G4KQE, tel Silver End 83094.

Colchester (CRA)—Thursdays fortnightly, 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189.

Felixstowe (FARC)—Tuesdays, informal, 8pm. Felixstowe Ferry Golf Club. Details from John Hobin, G3XIX.

Great Yarmouth (GYRS)—Last Thursday in each month, 7.30pm. 67 Southdown Road, Great Yarmouth. Details from Tony Besford, G3NHU.

Harlow (H&DRS)—Tuesdays, 8pm. Mark Hall Barn, First Avenue. Details from A. Keeble, G4HPU.

Haverhill (H&DRS)—Fridays, 7.30pm. Steeple Bumpstead Road. Details from Dave Hickford, G4MVK, tel Haverhill 61207.

Ipswich (IRC)—Second and last Wednesday in each month, 8pm. Club Room, Rose and Crown, Norwich Road. 13 January ("An Illustrated History of Suffolk", by Philip Willis), 27 January ("How the RAE works", by Henry Massey, G8YXP, lecturer at Suffolk College). Morse classes are also available. Details from Jack Tootill, G4IFF, tel Ipswich 44047.

Loughton (L&DARS)—Fridays fortnightly, 8pm. Loughton Hall, Rectory Lane. Details from B. Capon, G8UBH.

Lowestoft (L&DARC)—Fridays, 7.30pm. North Suffolk Teachers' Centre, Lovewell Road. Details from Terry Weatherly, G3WDI, tel Lowestoft 63216.

Martlesham (MRS)—First Wednesday in each month, 7.30pm. British Telecom Research Laboratories, Martlesham Heath, Ipswich. Visitors always welcome but must first contact Simon Garrett, G4EVN, at the above address.

Norwich (Norfolk ARC)—Wednesdays, 7.45pm. Crome Community Centre, Telegraph Lane East. Details from Paul Gunther, G8XBT, tel Norwich 610247.

Southend (S&DRS)—Fortnightly, 8pm. St Michael's Church Hall, Sir Walter Raleigh Drive, Rayleigh, Essex. Details from A. Adams, G3YOA.

Stowmarket (SDARS)—First Monday in each month, 7.30pm. Red Cross Hall, Stowmarket Railway Station. Details from Jim Lowe, G8SCB, tel Needham Market 721296.

Thurrock (TARC)—First and third Tuesday in each month, 8pm. Grays Park Hall, Orsett Road, Grays. Morse tuition available. Details from G3KMD. Club net on 144MHz S21/22 on second and fourth Tuesday in each month, 8pm.

Vange (VARS)—Thursdays, 7 January ("Construction", by G4ENW), 14 January (Repeater group), 21 January (AGM), 28 January (Junk sale), 4 February (Discussion of new programme). 8pm. Main Hall, Barstable Tennants' Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.

Basingstoke (BARC)—Third Wednesday in each month, 20 January (RSGB video tapes), 7.30pm. Chineham House, Popley, Basingstoke. At the recent AGM the following were elected: chairman, G8GJZ; sec, G6CPA, tel Tadley (07356) 4964.

Basingstoke (UK FM Group Southern)—First Wednesday in each month, 7.30pm. Chineham House, Popley, Basingstoke. Chairman Mike Payne, G3ZRM, tel Aldershot (0252) 26108.

Bournemouth (BRS)—First and third Friday in each month, 15 January (Lieut Gough, RNLI, film and RNLI communications), 7.30pm. Kinson Community Centre, Kinson, Bournemouth. At the recent AGM the following were elected: chairman, G4LKI; sec, G4EKE, tel Ferndown (0202) 877945.

Chippenham (C&DARC)—Tuesdays, 7.30pm. Chippenham Sea Scouts HQ. Sec G8UGY, tel Bromham (0308) 850289.

Fareham (F&DARC)—Wednesdays, 6 January ("Logic", by G4ITF), 13 January (Natter night), 20 January ("RTTY", by G4ITF and G8VOI), 27 January (AGM), 7.30pm. Porchester Community Centre. Sec G4IGT, tel Fareham (0329) 234904.

Fareham (HMS Collingwood ARS)—Wednesdays, 7.30pm. Details from sec G8OWJ, tel Fareham (0329) 234139.

Farnborough (F&DRC)—Second and fourth Wednesday in each month, 13 January (Talk by Wood & Douglas), 27 January (Talk by G3ZUM on his prize winning AATU), 7.30pm. Railway Enthusiasts Club, Access Road, off Hawley Lane (near M3 bridge). Sec G4BJQ, tel Farnborough (0252) 43036.

Guernsey (GARS)—Tuesdays and Fridays, 8pm. The Lodge, La Carbinerie, St Martins. Sec GU8OVO, PO Box 100, St Peter Port.

Horndean (H&DARC)—Second Thursday in each month, 17 January ("Home brew aerials", by G3GVC), 7.30pm. Merchiston Hall, Horndean. Sec G6GBM, tel Horndean (0705) 593429.

Jersey (JAEC)—Second Wednesday in each month, 7.30pm. The Quennevais Communication Centre, St Breladé, Jersey. Sec Mrs M. Smith, tel 0534-23248.

Jersey (JARS)—Sundays, 10.30am, Fridays, 8pm. Le Hocq Tower, St Clement, Jersey. Sec R. R. Ford, tel 0534-31131.

Poole (PARS)—Last Friday in each month, 7.30pm. Poole Technical College. Sec G8ZCG, tel Broadstone (0202) 693986.
Portsdown Hill Repeater Group—Sec G8GNB, tel Titchfield (03294) 41456.
Portsmouth (Marconi E&ARS)—Last Tuesday in each month, 8pm. Broad Oaks Works Canteen, Portsmouth Airport. Details from G8NEH, tel 0705-738067.
Portsmouth (P&DRS)—Thursdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland. Sec G3JZV.
Salisbury (SR&ES)—Tuesdays, 7.30pm. Grosvenor House, Churchfields Road, Salisbury. Sec G2FIX, tel Wilton (072274) 3837.
Southampton (SUARC)—Tuesday evenings. Informal meetings every lunchtime in the Club Room, Old Union Building. Sec A. C. Talbot, The Radio Club, JCR Post, The University, Southampton.
Southampton (SARS)—Wednesdays, 7.30pm. Toc H House, Little Oak Road, Bassett, Southampton. Sec G4MYS, tel Southampton (0703) 782545.
Southampton (Waterside Shortwave Club)—Fourth Tuesday in each month, 26 January ("Receivers", by G3OZT), 7.30pm. Blackfield Community Centre, Blackfield, near Southampton. Sec G6DLJ, tel Fawley (0703) 891975.
South Dorset (SDRS)—First Tuesday in each month, 5 January ("Linears and power supplies", by G8HVY), 7.30pm. Civilian Canteen, Army Bridging Camp, Wyke Regis, Weymouth. Sec G3ZGP, tel Weymouth (0305) 812893.
Swindon (S&DARC)—Thursdays, 7.30pm. WI Hall, Dores Road, Upper Stratton, Swindon. Sec Ian Browne, tel Swindon (0793) 485564.
Winchester (WARC)—Third Saturday in each month, 8pm. The Scout Log Cabin, Stockbridge Road, Winchester. Sec G3MCL.

Happy New Year to all members in Region 17.

Members of the Acton, Brentford & Chiswick ARC in September 1981 at their monthly venue—the council chamber of the old Chiswick Town Hall. L to r: (standing) G3IGM, G2DHI, G6GCE, G5ZA, G5KD, G4DKL, G3GEH (sec), G3CCD (chairman); (foreground) G2FRI, G4GRM, G3OJX, RS46145 and G3IIN with dog. *Photo:* **G3CCD**

REGION 18—RR W. A. Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland. Tel Longhorsley 259.

Durham (DURES)—During term. Physics Dept, Science Site, Durham University. Sec Mark Puddephat, Oswald 299 Grey College.
Easington (EAR&EC)—Tuesdays and Thursdays, 7.30pm, Easington Village Workmen's Club. RAE and morse tuition if required (the club has a good pass record). Details from sec G4GXI.
Great Lumley (GLAR&EC)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. Sec G8HPW.
Hartlepool (HRH)—Mondays, 7.30pm. Methodist Church Hall, Frange road, Sec G3NWU.
Middlesbrough (Post Office ARC)—All amateurs welcome, but first contact sec G8CDP.
Middlesbrough (Teesside Repeater Group)—Last Tuesday in each month, 7.30pm. 196 Marton Road, Middlesbrough, Cleveland. All amateurs and swls invited but first contact sec G8MBK.
Morpeth (Northumbria RC)—Thursdays. Old Telephone Exchange, Ellington. Sec G4GWB.
Newcastle upon Tyne (Tyne & Wear Repeater Group)—Arts Common Room, Claremont Tower Block, Newcastle University. Sec G4DOB, tel Newcastle 744444.
South Shields (SS&DRS)—Fridays, 7.30pm. Trinity House. Sec G8BQF, 67 Lauderdale Avenue.
Sunderland (SRAS)—Mondays, Thursdays, 7pm. Sundays 9.45am, RAE and morse tuition. The Brewery Buildings, Westbourne Road. Sec Ian Batley, G8TKU, tel Sunderland 72746.
Tyneside (TRS)—Mondays, 7.30pm. The Community Centre, Vine Street, Wallsend. Activity and interest in most bands. Club callsign, G3ZQM. Sec G4ILW.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Barking (BR&ES)—Details of club from Alan Sammons, G8IZN, tel 01-594 2471.
Central London (Post Office HQARG)—Weekly net Wednesdays, 8pm, local 3·750 for PO and BT folk. Sec G3TIS, tel 01-836 1222, ext 2602. Further details from J. A. Clarke, Room 521, Electra House, Victoria Embankment, London WC2. Only open to Post Office members.
Cheshunt (CDRC)—Wednesdays, 8pm. 6 January (Natter night), 13 January (Equipment night), 20 January (Natter night), 27 January ("Intro to amateur radio/SSB Field Day, 1981", by Nick, G8NDR, Video). Church Room, Church Lane, Wormley, Herts. Enquiries to Jim Sleight, G3OJI, tel Ware 4316. This club has a newsletter for full information on events.
Chingford (Silverthorn RC)—7.30pm. Friday Hill House, Simmonds Lane, Chingford E4. Sec G4AJA, tel 01-529 2282.
Chiswick (ABCARC)—19 January (AGM), 7.30pm. The Committee Room, Chiswick Town Hall, High Road, Chiswick, London W4. Enquiries welcomed to sec W. G. Dyer, G3GEH, tel 01-992 3778.
Ealing (E&DARS)—Tuesdays, 8pm. Northfields Community Centre, Northfields Road, London W13. Sec E. Batts, G8LWY.
Edgware (EDRS)—14 January (AGM), 28 January (Informal), 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Net frequency 2200 Mondays on 1·875MHz. Sec Howard Drury, G4HMD, tel 01-952 6462.
Grafton (GARC)—Second and fourth Friday in each month, 8pm. The Five Bells, East End Road, East Finchley, London N. Sec John, G8SYD, tel 01-957 8785.
Harrow (RSH)—1 January (No meeting), 8 January (Radio phones and pagers), 15 January (Informal and practical), 22 January (Film show), 29 January (Informal), 8pm. Roxeth Room, Harrow Arts Centre, High Road, Harrow Weald, Middx. Enquiries to G4AUF, tel 01-868 5002. Refreshments (a pint or two) are obtainable very near by, meetings start at 8pm if they can get some members out of the bar!
Havering (H&DRS)—Wednesdays, 8pm. Fairkytes Arts Centre, Billet Lane, Hornchurch. Further details from A. Negus, tel Upminster 24059.
Ilford (IRSGBG)—50 Mortlake Road, Ilford, the QTH of Jim, G3PCA. Details from sec G3LRE, tel 01-500 7196.
London (Imperial College ARS)—Details from G4MIK, tel 01-589 5111, ext 1301, daytime.
St Albans (Verulam ARC)—Last Tuesday in each month, 7.30 for 7.45pm. Charles Morris Hall, Tyttenhanger Green, Nr St Albans. Informal meetings second Tuesday in each month, RAFA HQ, Victoria Street, St Albans. Details from Hilary, G4JKS.
Shelburne (SRC)—Thursdays, 7pm. Shelburne Youth Centre, Hornsey Road, London N7. RAE courses available. Sec T. C. Clark, G4BZW, tel 01-249 1843.
Southgate (SARC)—Second Thursday in each month, 14 January ("An introduction to digital electronics" by Keith Holland, G3MCD), 7.30 for 8pm. St Thomas Church Hall, Prince George Lane, Oakwood N14. Sec Val Austin, G4MCD, tel 01-360 5832.
Stevenage (SDARC)—First and third Thursday in each month. 7 January (Computer evening, bring your own), 21 January ("The QSL Bureau", by G3WTV), 8pm. Staff canteen, BAD Ltd, Site "B" Gunnels Wood Road, Stevenage, Herts. Morse classes are held at this club. Sec G8LXY, publicity, G8MCV, tel 0462 53414 or 0438 64624, evenings.
South West Herts UHF Group—This group runs GB3HR at Bushey Heath and are currently working on returning to their 10GHz beacon to service from a site also at Bushey Heath. Donations are very welcome for these projects and for the planned 1·3GHz beacon repeater GB3BH. Funds are currently extremely low due to the group having to pay rates on their antenna mast, so any help with the costs would be very much appreciated by their treasurer Brian Greenaway, G3THQ.
Wanstead (ELRSGBG)—This group meets on the third Sunday in each month. 17 January (AGM, which is a trifle away from the normal programme. One of the items on agenda is for the change of name of this group. The other is election of officers), 3pm. Wanstead House, The Green, Wanstead, London E11. Refreshments available. Details for all new and old members. Sec G3PKQ or G3AMF, tel 01-989 9224.
Watford (WRC)—Small Hall, Christ Church, St Albans Road, Watford. Details from sec C. Tredwell, G8CHW.
West Drayton (LT District Line ARC)—Thursdays, 6pm. DLAA Sports Ground, Park Place, Gunnersbury Avenue, W3 (Bar). Details from R. Ball, G8JEB, tel 01-422 0414. Club net 144·250MHz ssb, 2000-2100 local.
UK FM Group—The Winning Post Pub, Epsom Race Course, Epsom. Sec G8KVP, tel 01-531 0866.

RR19 has heard suggestions that an ORM should be held next year in the region. This would give north London and Herts RSGB members a full afternoon to air their views to senior members of the RSGB. It could also be used as a general social evening or dinner. Please let RR19, G3AAJ, have any members' views on the subject, *by letter only please.* Club secretaries are also asked to give general opinions on venue, date, time, etc from their clubs. Deadline end of March.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park Portishead, Bristol BS20 8NQ.

Bridgwater (HPSSARS)—Second Monday in each month, 7.30pm. YMCA, Nr St John Ambulance Hall. Further details from G4ETN.
Bristol (BARC)—Tuesdays, 7.30pm. The University Settlement, Barton Hill, Bristol 5. RAE classes, etc. Sec G8GFZ.
Bristol (Brunel TC RS)—welcomes licensed students to operate club station, G4FNB. Student swls welcome. Details from Students Union, c/o Brunel Technical College, Cabot House, Ashley Down Road, Bristol BS7 9BU.
Bristol (North Bristol ARC)—Fridays, 7.30pm. c/o Self Help Enterprise, Braemar Crescent, Northville, Bristol. Efforts are being made to accommodate new members. A call to Ted Bidmead, G4EUV, tel 0272 691685, will give you the latest info. While visiting the club recently, RR20 was pleased to meet Harold Hepburn, VK3AFQ, from Melbourne, an ex-Bristolian who left the UK around 1950. Harold was licensed in Australia about 1960, was vice-president of the WIA in the late 1960s and is still on the Federal Executive. Harold also helped to build the first Australian satellite

AO4 in 1967. 14MHz is his favourite band where he looks for contacts in the UK and particularly with Bristol amateurs.

Bristol (BRSGBG)—25 January, AGM, election of the 1982 committee, followed by a talk on "Society matters" by Les Hawkyard, G5HD, and "Raynet in 1982", by Brian Goddard, G4FRG (Raynet Area Controller, Avon and Somerset), 7.30pm, Queens Building, Bristol University. Further info from Chris Short, G8GLQ, tel 0272 621253.

Bristol (Shirehampton ARC)—Fridays, 7pm. Twyford House, Shirehampton. RAE and morse classes. Lectures, films and df hunts planned, HF and vhf station, G4AHG, active. Sec G4GTD.

Bristol (UoBAR&CS)—For information contact Mark Posen, G6DYY, c/o Students Union, Bristol University. The society's club station G3KAC is again active.

Cheltenham (CARA)—First Thursday and third Friday in each month, 7.30pm. 7 January (Video tape of Dud Charman's (G6CJ) aerial circus), 15 January (Natter night). Old Bakery, Chester Walk, Clarence Street, Cheltenham. A recent newsletter carried an interesting article by Evan, G3CJ, on the 144MHz band, its planning and purpose. Details of this and the club's activities can be obtained from Grant Cratchley, G4ILI, tel 0242 43891.

Cheltenham (Smiths Industries RS)—Third Wednesday in each month, 7.30pm. Club House, Newlands, Bishops Cleeve, Cheltenham GL52 4SF. Sec Roger Hawkins, G8UJJ, c/o 101 Tobysfield Road, Bishops Cleeve, Cheltenham, Glos, tel 0242 67 2175.

Gloucester (GARS)—Thursdays, 7 January (Members slide evening), 7.30pm. Chequers Bridge Centre, Painswick Road, Gloucester. Further info from Tony Martin, G4HBV.

Mendip Repeater Group—GB3WR, GB3UB and GB3VS (70cm proposed—RB13, location Glastonbury). Subscriptions to hon treasurer, G8NNU. Information from sec G8GMZ.

North Avon Repeater Group—It is hoped to organize a meeting in Bristol for those interested in 1·3GHz. Coverage checking from the site of GB3AA will be starting soon and reports will be welcome. Further info on repeaters "AA" and "BS" from Terry Rowe, G8NNU, tel 0272 559398.

Portishead (Gordano ARG)—Fourth Wednesday in each month, 8pm. The Ship Hotel, Down Road, Portishead. Details from G3LJD.

Taunton (TARS)—Fridays, 7.30pm. The Basement, The Mount, Taunton. Details from sec G8TJF.

Weston-super-Mare (WsMARS)—Third Monday in each month, 7.30pm. Rugby Club, off Drove Road, Weston-super-Mare. Sec G3BLO, or details also from G3PQE, tel Weston-super-Mare (0934) 22712.

Yate (Y&DARC)—First Friday in each month, 8pm, G3RQN QTH. Further details from G8LGC.

Yeovil (Y&DARC)—Thursdays, 7 January ("The Secret Listeners" video tape), 14 January ("How to use J-fets", by G3MYM), 21 January ("Receiver front ends", by G3DSS), 28 January (Natter night), 7.30pm. Building 101, Houndstone Camp, Yeovil. Club nets Sundays, 3·660MHz ssb at 10.30am, and Tuesdays S14, fm, 144MHz, 8.30pm. Sixteen members sat for the December RAE. Morse tuition is available. Further info from Don McLean, G3NOF, tel 0935 24956.

MEMBERS' ADS

CONDITIONS OF ACCEPTANCE

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Member's Ad form printed on the back of a *recent* address label carrier used to mail *Rad Com* to the advertiser: this will automatically provide proof of membership and should not be more than two months old. No acknowledgment of receipt will be sent, and advertisements not clearly worded or punctuated, or which do not comply with the conditions of acceptance, will be returned. No correspondence concerning this service will be entered into.

Trade or business advertisements, even from members, will not be accepted for "Members' Ads" but should be submitted as classified or display advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions, or for the quality of goods offered for sale. Advertisements for citizens band equipment will not be accepted.

Warning. Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a finance company could result in the "purchaser" losing both the goods and the cash paid.

The current rate is £1 for 40 words or less: advertisements containing more than 40 words will cost an aditional £1 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

Closing dates in 1982 for issues in brackets, are **21 January** (March), **25 February** (April), **23 March** (May), **21 April** (June), **19 May** (July), **17 June** (August), **15 July** (September), **25 August** (October), **23 September** (November), **21 October** (December), **18 November** (January 1983), **16 December** (February 1983).

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising representative

FOR SALE

Collins KWM380 tx/rx, all accessories, £1,750. Alpha 78 bandpass hf linear, £1,650. SX200 scanning rx, £185. Monitorscope, £75. Motorola Maxar hi-band fm, 10ch, 25W tx/rx, £150. Motorola 25W synthesized marine tx/rx converted for 2m, £150. TenTec KR40 squeeze keyer, £40. Bird 4381 digital power analyst, £350. Racal 35MHz counter/timer type 9520, £50. HP970A probe dvm, £65. Tel 01-390 4817, after 7pm.

Immac Drake C-line T4XC tx, R4C rx, both in mint cond, numerous extra accessories, tx has hb psu which will also power transverter for uhf/vhf, all this performance for £569 ovno. GM3WTA, QTHR.

Trio 2300, comp with charger, nicads, carrying case, £130. G8JNG, QTHR. Tel 061-789 3552.

FT707, FC707 atu, mobile mount, YM37 mic, all as new, boxed, ideal base/mobile/portable station, £515. G3TSO. Tel Tetbury (0666) 53425.

Yaesu FR101 digital, matching spkr, boxed, manual, pristine cond, a.m./fm/ssb/cw, 144MHz, £385. Trio R820 digital, the ultimate rx, boxed, manual, leads, mint, £495. Swap for anything interesting. G3RCQ. Tel Hornchurch 55733, evenings.

Heathkit SB620 Scanalyser, new £75. Datong asp speech processor, mint, £45. BC221, orig charts, spare valves, psu dubious, £14. Ex-WD audio oscillator (mains), £10. All items ono. Good choice meters, valves, relays. G3FLD, QTHR. Tel Telford 0952 3758, evenings, weekends.

Property of the late G3OOG: Icom IC2E 2m tx/rx with charger, £130. TR7200G, £95. BC221 with charts, vgc, £25. Magmount with 2m whip, £7. SAE for full list. G3UQZ, QTHR. Tel 021-373 8806.

Yaesu FT227RB 2m tx/rx, used little, £180. G8UMA, QTHR. Tel Frensham 3607.

Drake R4B extra broadcast band xtals, usual 160 through lower part of 10, good cond, buyer to collect or arrange, £125. Tel Basildon (0268) 416884.

Trio DG5 digital display, manual, £75. Bauer single-paddle key unit, as new, £10. Carriage extra. G3UQZ, QTHR. Tel 021-373 8806.

AR88D, vgc, £50. G3HEQ, QTHR. Tel 0484 602902.

Atlas 210X with ac pu, deluxe mobile mounting bracket, Atlas mobile antenna matching transformer, G-whip tribander helical, 80 and 40m loading coils, base, two whips, all in good order, £320. G3KLF. Tel Fareham 236906, weekends or evenings only please.

Trio 2400, external spkr/mic, £150. Eddystone 880/2, £195. Eddystone EC10, £75. KW77, £50. TS520E, VFO520S, AT200 AE tuner, DG5 digital display, MC50 mic, £450. Icom IC251E, £400. *Wanted:* GEC BRT400E. Tel Nottingham 582358, after 7pm.

Marconi CR100 wartime rx, exc wkg order, instruction manual, £28. G4JFU, QTHR. Tel Fowley 3245.

QTH: Solihull, W Midlands, attractive traditional three bedroom semi, semi-rural location, freehold, full gas central heating, large attractive gardens, space for garage and caravan storage, planning permission for 80ft tower and 160m dipole, around £28,750. Tel 021-454 5275, office.

Heathkit SB101, HP23A, SB600, mic, good cond, £175. G4CEY, QTHR.

HF5 vertical antenna, £30. AM10D Cambridge on 4m, Garex fm board fitted, £35. Exchange Canon AE1 camera, telephoto, wide-angle lenses, accessories, for hf or vhf tx/rx, cash adjustment. G4GMA, QTHR. Tel Kidderminster (0562) 515405.

IC202S beaconband, Oscarband, 144·600-144·800, nicads, helical, case, mint, £150. MM linear 144/25, £35. Oskerblock SWR200, £25. AR40 rotator, £35. G-whip tribander, lf coils, £35. 9-el fixed Tonna, 20yd RG8U foam, £10. 9-el portable Tonna, 10yd UR67, £12. HB9CV beam, £6. Jaybeam Halo and mast, £3. 5XY beam phasing harness, £12. 18ft portable mast, Tonna, £10. G4FKR, QTHR. Tel 0962-72 557, evenings.

TS520S, perfect cond, cw filter, mobile psu, £400 ono. IC202S, vgc, comp with high power nicads, charger, spare mic, helical, £110. G4FJB, QTHR. Tel 021-705 7158, after 5pm or weekends.

VFO30G for Trio 2200GX or 7200G, £50. Buyer collects. G8RHB, QTHR.

Trio 2200G, xtalled S19-23, R3-7, Raynet, leather case, strap, charger, nicads, mobile mount, handbook, WD 10W pa, good cond, £95. G8OXO, QTHR. Tel Bexhill 215619.

G6MN: selling owing to illness, 12 nife batteries, 1·5V, 75A Bang & Olsen turntable, pick-up; small 4W amplifier, 0-10, 0-100, 0-2000m ac voltmeter, coaxial antenna, switchover low pass filter, Wharfedale 12in spkr, pressure column, HRO/power pack/10 coils, incl 5BS 500V megga E & V transverter, 28/144MHz, power pack, converter 28/144, valve voltmeter, Heathkit universal avo meter, Ferrograph tape recorder, reel-to-reel, 898 KW trapped dipole, 80-10m, six boxes assorted 2, 4, 6BA nuts/bolts, two boxes Belling LEA sockets, two boxes American BNL sockets etc, two boxes resistors, condensers, lf choke, 6V soldering iron, transformer, 6/12/18V, all must be sold in one lot, offers. G6MN, QTHR. Tel 0909 47315.

Television camera, studio type, viewfinder, psu, control units, etc, 14in monitor, solid-state, wkg, £35. Colour monitor decoders, much other tv studio equipment, 1in Vidicon scan coils, £3.75. G8GQS, QTHR. Tel 0427 3940.

Icom IC260E 2m multimode without ball bearing, 18 months old, good, clean cond, £260 ono. G8NRJ, 122 Stradbroke Road, Lowestoft, Suffolk. Tel Andy, 0502 4122. After 10 January tel 01-399 0147.

IC240, as new, no mods, mobile and base antennas, £150. Trio 9R59DS rx, £45. G8XTL, QTHR. Tel Scarborough 863221, after 6pm.

Special mic plug for FT207R, £6. Copy of workshop manual Bearcat BC220(FB), £3. RTTY stations frequency list, £3. Crispino Messina, I5XWW, Via di Porto 10, 50058 Signa (FI), Italy.

FT707S Wayfarer hf tx/rx, new bands, hardly used, still under warranty, exc cond, £425 ono. Microwave Modules 28/144 transverter, as new, £70 ono. Viv Hill, G4HDF, 26 Haydn Road, Basingstoke, Hants RG22 4JG. Tel 025679 2282.

Belcom Liner 2 2m tx/rx, good wkg order, £65. G8HRK, QTHR. Tel 0424 84262.

FT101, one previous owner, mint cond, fitted latest rf board, 200Hz cw filter, recent overhaul, comp fan, mic, ac/dc power leads, spare pair new 6JS6Cs, handbook, top-band transverter, for use with FT101. Carriage extra, £350 ono. G3KSH, QTHR. Tel 0535 34256.

NRD515, one of the finest rxs ever, only four months old, showroom cond, comp with orig packing, under warranty, change of equipment forces sale, £825. Free Securicor delivery. G3HWX, QTHR. Tel 0704 840328.

FRG7, fine tuner, perfect order, £100. *Wanted:* TS120V or TS130V. G4JFE, Wash Water House, Newbury, Berks. Tel 0635 41613.

FR50B, good cond, used little, £70. Tel London (01) 624 6268.

TR2200GX, 12 channels, S15-23, R0, R3, R5, nicads, case, carry strap, charger, 10W pa, manual, psu lead, vgc, £90. G8AHE, QTHR. Tel 021-458 2406.

FT7, 10-80 hf tx/rx, vgc, £240 ono. TR9000 2m multimode, less than 12 months old, £295 ono. Various other bits and pieces. Details from G4MPE (G8WTI), QTHR. Tel Bracknell 50831.

TS515, exc cond, power supply, spkr, £200. G3HLG, QTHR. Tel 0636 72621, work, 0636 892384, home.

Ex-Naval 619 cat rx/tx, power pack, all connect leads, service manual, ex-RN frigate Tenby, £100. Buyer collects. GW4IGR, QTHR.

6800 computer, twin 5in disk drives, 36k ram, disk controller etc, uses Exorsisor bus boards, dos basic asm bct, can be seen wkg, £600. G8BXH, QTHR. Tel 01-428 0974.

Storno 500 handheld, 3ch, wkg 2m, £45. Ultra Cub handheld, 2ch, wkg 2m, toneburst, batteries, £35. Two Ultra 3A4 handhelds, wkg 70-26 a.m., batteries, charger, £50. Precision avo, £20. Marconi valve voltmeter TF1300, £10. Ultra Lion 10ch fm, 20W out on 2m, £70. Prefer buyer collect. All plus carriage. G4CFH, QTHR. Tel Bloxwich (0922) 405294.

Modern teletype, Extel Transtel 80 col potmatrix printer, Fifo buffer, ASCII, 110 and 300 baud, keyboard, RS232 interface, £250. Storno 500 2m handheld, £60. 3·6kVA mains isolation transformer, £45. ICL Termiprinter, 300 baud, RS232 io, ASCII, £120. G8BXH, QTHR. Tel 01-428 0974.

TR7500, perfect, comp, £150. TR7200G, nine repeater, nine simplex, incl 144·8, £110. Antique 1944 S20R Sky Champion with handbook, senile but working, offers. G4FJN, QTHR.

TR9000 2m multimode, less than 12 months old, £295 ono. FT7, 10-80, hf tx/rx, vgc, £240 ono. Various other bits and pieces. Details from G4MPE (G8WTI), QTHR. Tel Bracknell 50831.

DX302 rx, 10kHz-30MHz, pll digital, usb/lsb a.m. ac/dc, new, unused, comp, perfect, bargain, £230. G4FJN, QTHR.

Video Genie, 32k, colour, control keys, sound, as new, printer interface, software incl other languages (Pascal, Assembler, Forth), most popular games, books, £375 ono. Going hf (with luck). G8TQH, QTHR. Tel 021-440 4721.

Eddystone EA12 rx, realigned, manual, vgc, £160 ono. Heath SB301 rx, SB600 spkr, revalved, realigned, manual, £110 ono. SB401 tx, needs slight attention, £50 or £140 tx/rx pair. Tel John, Sedgley (Nr Wolverhampton) 73271.

FT221RD speech processor, preamp, AR40 rotator, 28ft mast, rigging, Slim Jim, 6-el quad, 88-el multibeam, 20m UR67, many extras, comp station, pull in the dx, vgc, £420. Prefer buyer collects or carriage extra. G4JUZ, QTHR. Tel 01-789 2622.

KW109 atu, the high power version, exc cond, suitable coaxial or open wire antenna, £70. G3UVE, QTHR. Tel 01-398 1239, evenings.

TR2400 2m synthesized portable, as new, carry case, four battery packs, ST1 base stand, car regulator, service manual, orig packing, all £240 ono. G8YQD. Tel Reading 474305 outside working hours.

B40 rx, £35. Hallicrafters SX16 rx, collector's item, comp with manual, £25. Tel Madingley (0954) 211189.

FT7, £220. Liner 2, £80. Pye U10B uhf Cambridge, RB10, £40. Pye Compact uhf handheld, £30. All in good wkg order. All with handbooks and accessories. G4GKB, QTHR. Tel 0926 493868, evenings, or Andy Crofts, 494111, daytime.

Marconi signal generator type TF995A/2M with handbook, £100. G3XAC, QTHR. Tel 0282 38514.

TA33JR 3-el triband hf beam, £70. Buyer collects. G3RVM, 27A Roman Way, Thatcham, Newbury. Tel 0635 66037.

Trio 120S, AT120, PS30, SP120, mic, used little, £500. Icom 260E, three months' use, £270. AT130, never used, £70. Kenpro rf processor, £50. Collect. Tel 0492 58030, after 6pm.

Azden 10m fm, as new, box, manual, £155. Trio R820, as new. FT101Z will swop anything interesting. G3RCQ. Tel Hornchurch 55733, evenings.

FDK Multi 700EX 2m fm synth, July 1980, good cond, £140 or part exchange, with cash, FTDX401 tx/rx. G8UNV, QTHR. Tel Bill, Aldershot 20128.

Marconi Kestrel 3 marine tx and rx, 200kHz-4·5MHz, ac psu, £50. Kestrel 1 tx/rx, working ok. Buyer collects. G4AYG, QTHR. Tel 025-55 7175.

Zycomm 25800 2m handheld, helical antenna, spkr mic, charger, £140. *Wanted:* Circuit plus any details of Advance power module type PM11. G6CBQ, QTHR. Tel Jim, 021-772 8814.

FT201, digital flight-scan, C8800, Parkair 1700 airband monitor, SR9 marine rx, personal stereo, Sanyo M4440, DFM7 freq counter, up to vhf, in case, all above vgc, handbooks, accessories, orig packing, offers. Lockwood. G3XLL, QTHR. Tel Mellis (Suffolk) 596, anytime.

AVO Model 8, £20. Carriage extra. Prefer collection. *Wanted:* KW E-Zee Match atu, or similar. GM3HVN. Tel 0738 27631.

Realistic DX300 0-30MHz rx, digital display, £130. Realistic vhf/uhf 50ch programmable scanner PRO2002, £200. Both in as new cond. FDK Multi Palm 2 2m fm, £60. Sommerkamp TS802 handheld, 80ch, 2W, £100. Trio TR7200G, 2m fm, £90. G6CUQ. Tel Astwood Bank 2282.

KW E-Zee Match, £30. SWR200 power swr meter, £30. Plessey PT15 a.m. 144MHz tx, £40. Storno CQP622 70cm tx/rx, £170. Pair power Selsyns, £40. Class D wavemeter, mains, £10. G3KSW, QTHR. Tel 0992 23452.

Lunar rf switched 2m preamp, boxed, as new cond, has helped to win a few contests, gift at £12. G3BDQ, QTHR. Tel Pett 2262, evenings.

Solartron scope CD1212, 24MHz dual trace, 40MHz single trace plug-ins, 24in long, 13in wide, 16in high, homemade trolley if wanted, best offer over £50. Buyer collects. Dardis, 62 Waverley Road, Reading. Tel 0734 590044, evenings.

Facsimile machine, Muirhead K401 180rpm a.m., easily modified for Meteosat, uses 9in electrolytic paper, £80. G8NFU, QTHR. Tel 03224 37033.

FT75 mains and mobile power packs, FV50C, £95. RX EC 10 Mk2, £68. Codar AT5 Mk2, £25. Europa transverter, £60. G3JMV, QTHR. Tel Sheffield (0742) 664370.

FRG7, mint cond, little used, buyer collects, £120. Tel Gerrards Cross 84845.

Trio DM800 dip meter, £45. Shure 444 desk mic, high impedance, plug wired for Trio, £20. Yaesu FP4 power unit, 13·8V dc, 4A, £25. All mint cond. G4GGN, QTHR south Birmingham. Tel 021-705 0759.

Trio 9R59D, rx voltage stabilizer fitted, external SP5D spkr, vgc, £50. TW 2m converter, Nuvistor stage, 21MHz i.f., £5. Tel Walton-on-Thames 48252, after 6pm, weekdays or weekends.

TS520SE, fitted cw filter, handbook, orig packing, perfect cond, £390 ono. BC221 wavemeter, charts, offers? G2HDU, Spinney Lodge, Cranham, Gloucester. Tel 0452 812384.

Motorola microcomputer system, cpu, 16k ram, 16k Basic/Assembler/Editor eprom, vdu controller, 5in monitor, keyboard, cassette interface, psu, rtty software and terminal unit thrown in, cost over £700, gift at £250 ono. Five-band trap dipole, barely used, £20. G3TXQ, QTHR.

Trio 7010 2m ssb base/mobile rig, 10W, 144·26-144·46, 5kHz steps, vxo, 144·050-144·150 cw, good cond, orig packing, offers around £100. C. N. Bauers, 17 King George Avenue, Leeds LS7 4LH. Tel 0532 628317.

KW2000B, mains psu, Shure 202 mic, recent new GE1646Bs, exc cond, £200. G6ZH, QTHR. Tel 0491 651259.

KW2000E mains psu, KW1000 linear, both in mint cond. G3JAX, QTHR. Tel 0243 572522.

QTH North Wales: modern four-bedroomed detached house, panoramic sea views, gas ch, brick garage, 43ft lattice tower, 200ft available for antennas in straight line. Excellent take off for all bands, £32,500 ono. GW3KYT, QTHR. Tel Colwyn Bay 55156.

TR2200GX, fitted S20-23, R3-7, R0, nicads, charger, telescopic, helical, carrying case, strap, power lead, manual, orig packing, prefer buyer collect, offers around £100. GM6AUX. Tel 0383 414416.

Heathkit tx/rx model HW8, power pack HWA71, bought March 1980, lined-up by Heathkit of Gloucester, April 1981, costing £18.25, sell for £125. S. F. White, G4FKW, 87 Dyas Avenue, Birmingham B42 1HQ. Tel 021-357 2009.

Telford TC9 tx, good cond, receive converter, LR1 colinear, 8-el 2m beam, will split, offers. GW4GNY, QTHR. Tel Guilsfield (0938 75) 441.

Murphy a.m. high band tx with QQVO640A pa, comp with psu, £30. Cossor high band rx with 24V psu, £15. Cabinet, rack type, 2ft 10in high, 1ft 6in deep, 1ft 9in wide, £5. Hi-mound electronic keyer EK103Z, £15. G3XVL. Tel Chesham (0494) 784883.

FT107M with DMS FP107 psu, first class cond, £730. Heathkit continuing education dc ac semiconductor electronic books with 3100 trainer and accessories, £100. G4BLB, QTHR. Tel Deal 3538.

IC202S, extra xtals fitted for 144·800-145·000 and 145·800-146·000, comp with box, instructions, etc, £110 ono. 25W Microwave Modules linear amplifier, £40 ono. G8PUR, QTHR. Tel 0462 35248, after 6pm.

RA17 Mk2, exc cond, cw handbook, £175 ono. G3CWM, QTHR. Tel 0279 723177, day, 0279 56347, evenings.

FR101 digital rx, mint cond, manuals, £350. G2FIX, QTHR.

Heathkit HW32 20m ssb tx/rx, 12V dc, homebrew mains supply, £80. KW2000 dc psu, £15. Solartron 300V 500mA rack mount, stabilized supply, £5. G3KWK, QTHR.

Icom IC240, £115. 5A reg psu, £10. STE Milan Bug 20 keyer, self-contained paddle, psu, two memories, £50. 10in illuminated globe, exc detail, £10. G4BYG, QTHR. Tel 0482 659947, after 6pm.

FT227R, fitted 25/5kHz stepper and scanner, good cond, £140 ono. Dymar hiband 1·5W 3ch walkie-talkie, xtalled R1, S20-21, comp with two nicad packs, charger, helical, exc cond, £40. G3XVN, QTHR. Tel 0630 4607.

Pocketfones PF1B, nicads, charger, £25. *Wanted:* Any surplus RAF manuals, especially AP2463, AP1186, AP2276 series. Navy BR1771 series REME service sheets etc. G8AVJ, QTHR.

Trio 2300 plus 5/8 whip, helical antenna, mains psu, nicads, charger, swr meter, £130. G4JRH, QTHR.

Pye LC10 fm boot mount, 10 channel mobile, 40W linear, toneburst, rx preamp, control unit, cables, xtals R0-7, five simplex, offers. Kenwood TR3200, xtalled RB0-14, four simplex, case, nicads, charger, helical, manual, £120 ono. G2AFD, QTHR. Tel 06845 3242.

Trio 2300 2m tx/rx, exc portable/mobile, nicads, case, charger, helical, only 1yr old, £130. Goodmans Module 80 tuner/amp, Lenco turntable, exc, £70. Imperial electric typewriter, office model, £90. Tel Sutton Courtenay (Oxfordshire) (023 582) 249.

Icom IC280E 2m tx/rx, immac, used little, technically perfect, £200. DAC stabilized power supply, 13·8V, £15. Magnetic mount, 2m car antenna, £12. G8DHZ, 9 South Terrace, Redland, Bristol. Tel Bristol 731365.

New Mullard L454 amplifier, continuous freq 23-60MHz, three 4-125As in final, £100. TS700, new cond, £220. G3LBG, QTHR. Tel 0702 521561.

FT225R, mint cond, unmodified, except addition KBQ preamp, recent model, boxed, reason for sale QSY hf, £440 ono. Grundig Satellite 3000, near mint, case, accumulator, £150. G3NET, QTHR. Tel 0934 812909.

KDK 2025E 2m tx/rx, 25W, 12V, used twice only, £150. Tel Harrow (01-863) 5812.

Trio AT200 antenna tuning unit, 1·8-30MHz (six bands), mint cond, only about 15h use, £70. Collect or carriage extra. Taylor, G4EBT, QTHR. Tel Rotherham (0709) 70021, after 6pm or weekends.

Yaesu FT280 (similar to FT480R), £270. Electronic Developments 2m linear amplifier/preamp, fully switched, monitored (QQVO640 with built-in power supply), £70. Belcom Liner 2 with preamp, £70. G8MPB, QTHR. Tel Bloxwich 75057.

Fully synthesized handheld 2m tx/rx, Yaesu FT207R, comp with nicads, charger, carry case, helical, extension spkr, mic, spare nicads, cost new, £187, brand new cond, still boxed, £155. G8ZYU. Tel Herriard (025683) 528.

MMT432/28S, mint, £115. G3PLX vdu, memory (Catronics boards), Ferguson 3816 tv, ST6 tu, £150. Two new RS SO9620 cabinets, £15. Offers invited for P80 tower, Ham-M, cables, guts. G3LDI, QTHR. Tel Wymondham 603463.

DC power supply for KW2000A, £10 ono. G6BVW, QTHR. Tel St Ives (0480) 67447.

Codar CR70A gen cov rx, £35 ono. G4CDK, QTHR.

Marconi brass key, replaced knob, £10. Antique valve holders, £1 each. Class C wavemeter, 1000kHz xtal, £3. HRO mobile psu, £7. RAF psu type 270, 600V dc, 200mA, £10. Joystick cartop harness, £3. Peto-Scott two-stage preselector, 0·55-43MHz, wkg, attention wc switch, £7. Ekco valved car radio, no psu, £7. Radiomobile car radio metalwork, suitable hb tx, £3. CCT SX24, £1. Handbook SCR/522/542 (US army aircraft rt), £3. Agreed carriage/collect. SAE info. G2FKS, QTHR. Tel 0223 247220.

AR88D with S-meter, manual, spares, exc cond, £65 ono. G4LVI. Tel Manchester (061) 865 2535.

Trio JR310 amateur bands rx serial 040384, vgc, ssb, 80-10m, usb, lsb, a.m., recent overhaul, operating

manual, £90. Purchaser inspect and collect. Tel Leicester (0533) 706776.

Atlas 215X 200W mobile tx/rx, comp with mic, handbook, psu, full set 10/160m G-whips, £285 ono. Bearcat 250, 50 programmable channels, inbuilt psu, 12/250V, searches and remembers 64 frequencies between 30/512MHz, bubble memory, £200 ono. G3IES, QTHR. Tel Bristol 500742.

Vintage 1500 valves, mostly pre-war British and American, some boxed, few tx, PO type brass key, £6. Lots vintage components, transformers, 18 set, HRO5T, etc. G6NZ, 17 Washington Road, Emsworth, Hants. Tel 0705 819968, evenings.

FLDX500 tx, FRDX500 rx, 240W p.e.p., good cond, buyer collects, £250. G3SUV, QTHR. Tel 07875 2519.

Trio 2300, six months old, mint cond, rr fitted, boxed, £130. Linear to suit above, 1·5W in, over 15W out, changeover, £28. Going multimode. G4GRU. Tel 061-440 0556, evenings, 061-439 5050, ext 573, day.

Trio 3200 12ch uhf tx/rx, xtalled three channels, RB0, SU18, SU20, still under guarantee, brand new June 1981, cost £164.95 plus £12 nicads, comp with case, carry strap, nicads, charger, fist mic, the lot, £135. Tel Sheffield (0742) 664453.

NEC CQP2200E 12ch 2m fm portable tx/rx, 1-3W, S20-23, R2-8, £95. G3ZAR, QTHR. Tel Hull 658984.

Complete rtty station: Creed 7ERP, sound cover, tu, tape reader, £50; memory and micro parts, 4116 drams, £9.50 for eight; 8085A, £4.50; 82575, £7.50; 8259A, £7.50; 8251, £3.50; 1771FDC, £15.50; 8202A dram controllers, £20; plus other Intel parts. MM144/28 transverter, £60. Jaybeam 4-el quad, 2m, £5; rotator for same, £15. G8OQM, QTHR. Tel 021-426 1221, after 6pm.

Scope, Advance OS2100 dual trace, four plug-in modules, good cond, £150. AR88D with fm in p/ex. Low distortion oscillator SG68A, 1·5Hz-150kHz, offers. Transistorized ac minivoltmeter type VM78, offers. Wide range mv meter type VM77A, offers. Digital panel meter DPM100, offers. T. Lawrence, 21 Henderson Drive, Dartford, Kent DA1 5LE. Tel Dartford 74070, evenings.

1,000lb ratchet winch, unused, £15. 800lb ditto, £12. Large junk box, approx 0·5cwt, worth hundreds, £25 to clear shack. Lots 2in 7g dural tubing, cheap. Details sae GW3CBA, QTHR. Tel Barry 741520.

NEC CQ110E hf tx/rx, digital readout, ssb, a.m. cw, cw filter, has facilities for fsk, sstv, 12V or 240V, £375. Trio TR2300, nicads, charger, £130. Panasonic RF2900 portable rx, 3-30MHz, lw, mw, fm, £120. G4MEP. Tel Cheltenham (0242) 510750.

MML144/100P linear, £85. 15A psu homebrew, £50. Metered V&A Hanson swr wattmeter, model FS301, 3·5-30MHz, £30. H. V. McEvoy, G4MRR NOT QTHR. Tel Letchworth 74234.

TR7010 2m ssb tx/rx, exc cond, buyer inspects and collects or carriage at cost, £120. G8DVQ, QTHR. Tel 0272 564740.

FT101B, exc cond, manuals, £350. ZX81 computer, as new, £50. FT202, comp with nicads, charger, battery eliminator, spkr, mic, £75. Good selection of radio control equipment, offers. Tel 0269 860649, anytime.

Yaesu FT227R, 10/1W FP4 power supply, good cond, £170. MMA144 preamp, MMC144/24 converter, power supply for same, £30. Garex power supply, 12V in, 165V/325V, £10. Two 805s, two 866As, 829Bs, 832As, as new, offers. Postage extra or collected. Tel Reading 588503.

KW Viceroy, 80-10m, 180W p.e.p., ssb tx wkg, vgc, £50. G4LMX, QTHR. Tel Steve, 0632 869659.

Silent key sale: Atlas 215X with psu; Liner 2; three-band gemquad; 2m quad; 12V 3A psu; Osker power-meter; KW 75Ω dummy load, offers. G3MCL, QTHR. Tel Winchester 65814.

Trio TS510, PS510, 80-10m hf rig, mic, manuals, good cond, wkg perfectly, £200 ono. *Wanted:* TS820S or similar, in good cond. G4HDI, QTHR. Tel Brian, 0484 26100 (West Yorkshire).

Compact sintered nicad cells, 1·20V, 16Ah, £2.23Ah, £2.50. Both 1h rated. Airmec sig gen, 201A, 30kHz-30MHz, calibrated atten, xtal marker, £40. FT227R/mobile mount, £135. *Wanted:* Bird Thruline elements and Termaline. GW3JUV, QTHR. Tel 0656 3875.

Trio 2300 tx/rx, charger,nicads, carrying case, lead for 12V system, manual, £110. Bearcat 220 rx, vhf, uhf, amateurs, aircraft, marine, public services, manual, mains/12V, £150. Magnetic mount antenna and cable, £8. RS46104. Tel Saffron Walden 30795, evenings.

IC202S 144-144·4MHz, 145·8-146MHz, 12V dc charger, nicads, packing, mint cond, £125. 70cm 5-el beam, used once, £5. IC255E, 25W fm, packing, mint cond, £165. Spkrs, 4Ω, 10W, £4. C-scope metal detector, 950D, £50. G4FQF, QTHR. Tel Romford 47998.

TR2400 2m, fm handheld, as new, unmarked cond, comp with manual, manufacturer's packing, all supplied accessories, £160 ono. BRS36110. Tel Nether Stowey (Somerset) 732864.

Microwave tx/rx wavemeters, 4-5GHz, can be modded to other frequencies, £8 each. Telford TC7 rx, £10. MRF646 45W, 70cm, 12V, £15. 70cm 19-el F9FT, £12. Fine 19in cabinet and panels, £10. Other bits for callers. G8KBQ, QTHR. Tel 0458 33145.

FT225RD, mint, £450. 70cm 4CX250B linear, SK620A base, Eimac valve, psu, £85 ono. New CCS1, HC1, heatsink, £30. SK600 base, £8. Eimac 4CX250B valves, £10. New 4-125 and base, £10. New bases, £1.25. G8KBQ, QTHR.

Trio TR2300 reverse repeater, 2·5W/250W, nicads, charger, helical, case, etc, £135 ono. Aged HRO rx, £25. 10ch 2m monitor/scanner, nicads, charger, as new, £45. G3XGE, QTHR. Tel Pete, 061-865 3191.

IC202 144·0-144·4,145·8-146, in orig box, £129 ono. G8MIA NOT QTHR. Tel Wokingham 781649, after 7pm.

Yaesu FT221R multimode tx/rx, 144-146, six xtals, vfo, full coverage, handbook, orig packing, £280. Prefer buyer collects South London. G3ACB NOT QTHR. Tel 01-670 4337.

Trio TS820S with VFO820, £600. Drake L4B, £550. Collins 30L1, £400. Heathkit scope SB610, £50. Hilomast pneumatic mast, 15/5100, 49ft, with compressor, £250. Strumech winch, unused, £100. Yaesu FRG7, £150. All mint cond, with boxes. G3NNT, QTHR. Tel 0695 422203.

Yaesu FR50B rx, 10-160m, xtal calib, manual, vgc, £70. Farnell psu, 0-15V, 15A, ov and oc protection, manual, vgc, £40. Heathkit IM16 solidstate voltmeter, manual, £15. *Wanted:* NEC CQ110E tx/rx. CQ301 linear. G6BAN. Tel Glossop 65752.

FT401, £230. IC210 2m 10W fm tx/rx, £160. Heathkit scope O52 with probe, £35. Oscaramp 10m preamp, £5. JXK converter 144/2B, £5. Transverters MMT432/28S, £90. QM70 432/28, £70. G4ALV, QTHR. Tel 01-460 3852.

Printer: Tandy Quick Printer Mk2; RS232; Centronics; upper and lower case; 16/32 characters per line; as new, comp with leads, £90 ono. Acorn Atom morse tutor program, 1-20wpm, on cassette and information sheet, £4. G8TON NOT QTHR. Tel Melton Mowbray (Leics) 822152.

IC245E multimode, £260 ono. FT207R, NC2 base charger, spkr mic, £120 ono. G8VIM, Flat 3, 11 Gains Road, Southsea, Portsmouth, Hants.

Uniden 2030, 12ch 2m fm mobile, £75. Eddystone 770R vhf rx, £75. AT5 with psu, £35. Vintage Ecko TMB272 tv, not wkg, free. Please collect Eddystone and tv. G4JRB, ex-G8KEH, QTHR.

Trio 2200GX, nicads, charger, case, mobile mount, £99. Liner 2 ssb tx/rx, preamp, £90. Yaesu FT200, FP200 psu fitted, fan, rf atten, silent tune-up aid, vgc, £240 ono. GM4JJJ, QTHR. Tel Saline (Fife) 705, evenings or weekends.

NAG144XL 2m linear amp, 250W output, fantastic cond, £295 for quick sale. Drake T4X, R4C, in superb cond, both for £425, split? Western 3-el Yagi, good cond, bargain at £50. FT221R, worked 30 countries on ms, £200. G4HGI. Tel Lymm 3533.

QTH Yelverton, S W Devon, nine miles Plymouth, south facing split-level bungalow, built 1959 to owner's specifications, 0·66 acre ground, 600ft asl, very fine outlook, wood block floored hallway, lounge and dining room, two double bedrooms, large kitchen, bathroom, toilet (with wash basin), airing cupboard, retractable ladder to loft "shack", 18 by 12 by 7ft, integral garage 26 by 15ft with inspection pit, fully centrally heated, conservatory, well-kept garden, P40 versatower incl, £51,000. G3UVS, QTHR. Tel 082 285 2986.

Trio TS700S, £325. Trio 3200 70cm, four simplex, eight repeaters, £125. Yaesu FT101E, holdings fm unit, Shure 444 mic, matching spkr, atu, £425. MM144/28 transverter, suits above, £65. Cushcraft 10-15-20m vertical, £20. 18AVT 10-80m vertical, £45. G4IZL. Tel Northwich 76732.

FT202R handheld, 2m 1W, six xtals, as new, £75. Panda cub tx, £5. Large pile surplus equipment must go. G8UDJ, QTHR. Tel Abingdon 20005.

UK101 with 8k microsoft extended monitor, assembler/editor tape, various games, comp with psu, UK101 case, users manual, £170. FT202R, S20-23, R0, R5, exc mic, nicads, charger, manual, £75. G4DOV, QTHR. Tel Cheslyn Hay 414927.

FT75 tx/rx, £90, exc cond, also rtty cw keyboard, perfect, exc equipment, £100. AR88D rack model, exc cond, £45. G4KQG. Tel Nottingham 257396.

MMT432/144, £80. SWR bridge 144/432, £35. Murphy 13·8W psu, 5A, £15. ITC 9in monitor, £85. ICL 13·8V psu, 8-10A max, £25. Mobile mic MM202G, £10. IC202S, £125. G8ESK, QTHR. Tel 0274 45611.

FT227R 2m fm, 143-150MHz scanner, 25/5kHz steps, £140. Multi U11 70cm, eight repeater, four simplex, very hot rx, £140. General Electric 10m ssb mobile, bargain, £80. Yamaha B35 electronic organ, list £985, only £600 ono. G4JQP, QTHR. Tel 0761 34216.

Yaesu FT902DE and fm, filter new, boxed, £645. YD844A mic, dual Z, boxed, £18. Shure 444, £18. 401A, £12. Trio MB100, £12. MC35S, £10. AT120, £45. Drake MS4, £15. Sommerkamp YC355D counter, 200MHz, £75. Jim Taylor, G4ERU, QTHR. Tel Bournemouth 510400/513764.

Silent key sale: FT101 with 160m, FV101 remote vfo, £250. SB200 Heathkit 1kW linear amp, £225. EA12 Eddystone amateur bands rx, £90. Europa 2m transverter, £40. All in good cond, spare valves, manuals. G4KWL. Tel Reading (0734) 81330.

Radio Communication May 1966-May 1981, in exc cond, comp, offers. Tel Wilmslow (Cheshire) 533761, evenings only.

Racal communication rx 117E, good cond, £385. Yaesu FT75B with FV/50C vfo, £125. DT600 rtty demodulator and vdu, £250. Cambridge dash AM10, unconverted low band, £30. 19 set, £45. Synthesizer GEC, 1-30MHz, £60. Tel K. Burt, 024 369 4199.

Pye W15FM on five 2m channels, vgc, £60. GU3HKV, QTHR. Tel 0481 47278, 6-7pm.

Liner 2, exc cond, no mods, clean output, in orig packing, £90. G8AKB, QTHR Leicester. Tel Gordon, Whissendine (0664 79) 547.

100W output power 144MHz amp, fm/cw 12V dc, £40. KSR32 teleprinter, 50 baud easily converted to 45·5, £45. Buyer collect if possible. Used TT21 valves, £1 each. G3ZBU NOT QTHR. Tel Crawley 543809.

EDL144 linear/preamp, 100W output, spare valve, instructions, £100. G8MHX, QTHR. Tel Farnham 713642.

FT107M, all solidstate tx/rx, six band (ex memory option), FP107E external power supply/spkr, £575. Adonis AM502G base station compressor mic, £25. G2KF, QTHR. Tel 072 681 2337.

FT101EE, incl spkr, speech processor fitted, therefore equivalent to FT101E, good cond, still with clear plastic front, £320. Multi 2, 144-6 tx/rx, four-scan, 9/23 switched channels, xtalled, £120. G4LBQ. Tel King's Lynn 5619, evenings.

144MHz 40W pa, 2N6084 type in case, large heatsink, ok for IC240 etc, £26. Shack clearance, many components, transformers, etc, all cheap. G3OHC, QTHR. Tel 021-308 2512.

Trio 2300, nicads, charger, etc, MM144/25A preamp, Sief psu, 13·5V, 4A regulated, GPV5 colinear antenna, approx 30ft URM67 coaxial, swr meter, comp 2m fm station, £250 ono. Buyer collects. G4CQK, QTHR. Tel Walton-on-Thames 27199.

Yaesu FT225RD, as new cond, no mods, mic, manual, etc, £440. Would like to keep but wish to go hf (finances dictate). Buyer to collect. G4MZD NOT QTHR. Tel 021-444 8296, evenings.

Catronics 40W pa, perfect wkg cond, 10W lp, £27. G6ABT. Tel Abingdon (0235) 23034.

Video monitor, 12in screen, bw Philips, vgc; Jaybeam 2m/8XY antenna, only seven months old, exc cond, homebrew rotator, ex-RAF Selsyn system 18V dc required, electrically comp, wkg, no mountings; each item only £10. G8RAH, QTHR. Tel Oxford 66466.

Yaesu FT221R multimode tx/rx, comp with manual, orig packing; Microwave Modules transverters 144/28, 28/432, homebrew antenna changeover box, £400 incl. Will air freight to UK. Nigel, GU8OVO, "Argyll", Foulon Road, St Peter Port, Guernsey, CI.

FT250 hf tx/rx, late model, Datong asp clipper mic, W3DZZ antenna, £280. G3RK, QTHR. Tel Wangford (Suffolk) 619.

FDK M750E 2m multimode tx/rx, 144-149MHz, up-down mic, mobile bracket, etc, £250 ono. G8RJA NOT QTHR. Tel Reading (0734) 662651.

Collins 75A4 rx, KWS1 tx, comp with psu, £250, no offers, carriage arranged. Icom IC720A, brand new, unused, £720. Icom IC730, brand new, unused, £486. Tono 90W 2m linear with preamp, new, £70. G4LDT, QTHR. Tel 0632 551045.

Trio JR500S rx, amateur bands, 10-80m plus 10MHz, exc unmarked cond, handbook, £85. HRO rx, gen cov, 50kHz-30MHz, xtal filter, 10 coil packs, £35. GDO 1·5-150MHz, £10. G4DPP. Tel Burnham (06286) 3705.

KR400 rotator, £45. MBM48/70, £15. 8Y/2m, £8. HF5 vertical, £25. AVO model 9 Mk2, £45. Nascom imp printer, £200. ASCII keyboard, £25. Malcolm Connah, G4FMD. Tel 01-500 1000, during office hours.

Redifon R408 rx, £100. Redifon R50M rx, needs some attention, £20. MC150 marine tx/rx, £150. Marconi OA1094A spectrum analyser, lf extension unit, TM644B, psu, TM6580, best offer secures. G3UVZ, QTHR. Tel 01-778 4085, evenings.

TR2300, VB2300 10W amp, mobile mount, helical, nicads, charger, vgc, boxed, £160 plus carriage. HF5 trap vertical, virtually unused, buyer to collect, £30. *Wanted:* Valves 4D22 or 4D32. G3RFI, QTHR. Tel Potton (0767) 260800.

FRG7 with battery box, exc cond, boxed, £120. TR2400, soft case, used rx only, as new, £180. G. Obree, RS47988, 77 Loudoun Road, Newmilns, Ayrshire.

KW2000A ac psu, spkr, Shure 201 mic, good cond, £140. Vidicon camera, comp with lens, £35. Eddystone bug key, £5. Pye 17in tv monitor, £15. AR88D, good

cond, £45. All buyer collects. G3FRO, QTHR. Tel Empingham 652.

Hammarlund SP600 rx, 0·54-54MHz, £100. Cushcraft AV3 trap vertical, £15. MK705 squeeze paddle, £10. G4LMN, QTHR. Tel Norwich 54854.

Yaesu FR50B rx, 10-80m, 100kHz xtal, cal built in spkr, instruction manual, circuit diagram, mint cond, orig packing, £85. RV4 vertical antenna, 10-40m, £20. G3YXK, QTHR. Tel 0206 841538.

FRG7 rx, mint cond, fitted fm dis, dust cover, manual, £145. Prefer buyer collect. Tel Ashford (0233) 22506.

Yaesu FRG7000 rx, Microwave Modules MM2000 rtty to tv converter, both exc cond, highest offer secures. Tel Harding, Ingrebourne 45374 (Romford area).

Acorn Atom 12k ram 12k rom psu, many progs incl "invaders" etc, list price £290, selling at £230 ono. MK123 spy set with handbook, £45 ono. Prefer buyer collect or Securicor for computer. G8SVF, QTHR.

Xtals: HC6U; 3508; 3534; 3556; 7017; 12,300kHz; plus odds 7,000(2), 3,511kHz; neat pocket-size transistorized xtal activity tester and ditto 100kHz frequency marker, both cased with gen, £15 the lot, post paid. Tel 0373 64694.

Icom IC2E 2m fm handheld, £145. Packer 2m antenna tuning unit AT145, £12. G3NMZ, QTHR. Tel Luton (0582) 591749.

Drake TR4C, psu, Drake desk mic, matching Magnum processor, manual, spare valves, incl matched finals, superb performance, in vgc, must be worth £325 ovno. Prefer thorough trial/collection. Tel 061-766 5265.

AR240 handheld 2m tx/rx, covers 4MHz, 144-148, £120. DX33 tri-band penetrator beam Yagi, covers 20, 15 and 10m bands, max power 2kW p.e.p., £75. G4GPL. Tel 01-953 6921.

Heathkit HW100, hf tx/rx, with HP23A psu, orig manuals, clean cond, wkg order, £135 or exchange for Trio 2300. *Wanted:* R1155 in fb cond with mains psu. G4DEW, QTHR. Tel Northampton (0604) 491703.

FTDX560 Yaesu tx/rx, 10-80m, 560W ssb, 500W cw, immac, comp with matching spkr, mic, manual, one owner, £200. GM3AWW, QTHR. Tel 041-639 2370.

TR2200G, orig packing, accessories etc, mods for the better, S19-23, R0, R3-7, RR6, £80. Transformers, 20V at 20A, ideal 12V psu, £15, 800V at 0·5A, £15. PLX vdu boards incl keyboard, £45. Deliver locally or West Yorks, Sussex areas. G8JFF, QTHR. Tel Rushden 4008.

Zycomm Z5800 2m synthesized handheld, 144-148 in 5kHz steps, incl flexi, remote mic/spkr, charger, 15W amp, 7/8 whip, £185. Car telephone system, retails at over £1,500, only £950 or exchange hf gear. Cragg. Tel Dunstable (0582) 601401.

Trio 7010 2m ssb tx, cw xtal, rx preamp fitted, proven fb dx rig, in good cond, in daily use, new multimode forces sale, £85. Don Gowland, G4LGA, 78 Pleasant View, Bridgehill, Consett, Co Durham. Tel Consett 502004, evenings.

Yaesu FT221R, as new cond, orig box, £295 ono. G2ACK, QTHR. Tel 0342 21221.

CD44 rotator and control unit, £40. G4JPM, QTHR. Tel 0664 72 420.

Trio TR2200GX, R1-7, S18-23, case, charger, nicads, helical, £95. VFO309 complements above, £35. Trio TS520S, as new, £360. All orig packing. Icom IC225 synthesized 2m 80ch mobile mount, reverse repeaters, auto toneburst, 10W, £140. All carriage extra. G3WWL, QTHR. Tel 021-353 8874.

2400 handheld, with case, as new, £130. ST1 fast charger and power supply, £30. 2300 and VB2300, in ok cond, £150. MMC 2m/25W linear, £30. Plastic cased 2m preamp, £5. G3MSW, QTHR. Tel Harrogate (0423) 879202 (N Yorks).

FT901 dm, immac, used 6h only, comp, orig box etc, £600. G3PIZ. Tel Camberley 32342 or 01-485 2231, daytime.

FT101, comp with manual, good order, £200. KW Vespa tx, comp with manual, wkg, £50. G4IVT. Tel Watford (092) 49773, evenings only.

Standard C78 with CLC8 case, CMB8 mobile mount, nicads, SRC12/230 charger, CPB78 power booster, as new, in orig packing, £260 ono. G8BTX. Tel 0502 88175.

Trio TS515, 10-80m incl all of 10m, new 6146Bs fitted, spares for other valves, mint cond, orig packing, must sell, new rig purchased so open to offers. G4JTL. Tel Dudley 50327.

Jaybeam antenna MBM48, 48-el multibeam for 70cm, has been used entirely in loft for short time, as new cond, £23. G4FYJ, QTHR. Tel 363 1653.

Trio 2300, transportable, nicads, charger, case, mobile mount, helical etc, rev repeater and auto toneburst fitted, £130 ono. G6CSM. Tel 0925 55584.

Trio TR2400 handheld, charger, etc, vgc, £150. Trio JR310SE amateur bands rx, spkr, phones, Hamgear PM2 preselector, £110 ono. Trio TR2300, charger, nicads, reverse repeater, £115 ono. *Wanted:* Quiet rotator for 2m beam. G4CJO, QTHR. Tel Tony, Portsmouth (0705) 660682.

FT202R 2m fm handheld, six channels, S20-22, R1, R4-5, helical whip, carrying case, charger/ext supply lead, good cond, £75. G4IHY, QTHR. Tel Leicester 386064.

FT200, FP200, all 10m, Shure mic, speech processor, spare pa valves, manual, packing, good cond, £200. TW Communicator, 4m, tunable rx bfo, tx a.m./cw, 10W and over, 70·125, 70·200, 70·260, mic, mains psu/spkr, £35. G4JXK, QTHR. Tel Fareham 288566.

Gulbransen electronic organ, two 44 note manuals, 13 note pedals, switchable Leslie spkr, tremulo, chorale, sustain effects, 13 stops, rhythm unit, purchaser to arrange transport, £450. Exchange for suitable 2m multimode considered. G8RW, QTHR. Tel 01-462 1592.

All *ARRL 1981 Handbook*, £5. *Hints & Kinks*, £1.50. Solidstate design, £3.50. Swan atu ST3, cost $189, offers? RS33996, 39 Campbell Drive, Bearsden, Glasgow G61 4NF.

Storno CQL612F, 2m fm, built-in mains psu, spares, manual, £60. Liner 2, £75. UHF Westminster, 70cm fm, manual, £75. A.M. signal generator, 9MHz-280MHz, £15. Taylor valve voltmeter, £10. G8IWY, QTHR. Tel Milton Keynes 310071.

TS520S, immac cond, 250Hz cw filter, dc psu, Shure 444 mic, £400. IC225, 2m fm, 80 channels, £125. Gutter mount, cable, 5/8 whip, £10. TA32 tribander, worked 240 countries, £35. Andy Brown, G4EZT. Tel Maidenhead (0628) 30185.

FT202R, 2m fm handheld, S20-22, helical, carrying case, new cond, £65. G8KKN, QTHR. Tel Chester (0244) 43569.

Trio JR500 rx, good cond, £60. Liner 430 70cm ssb tx/rx, £150 ono. G8EXL, QTHR. Tel Northampton 404008, evenings.

Cambridge antenna noise bridge, £8. Various valves. *Wanted:* Sherwood 125CS filter. Noise blanker for R4C. G2UZ, QTHR. Tel Leeds 784074.

FT221R, YC221 external digital readout, £295 ovno. Liner 2, mint, matching Belcom psu, matching Belcom external vfo, mic, all leads, £95 ovno. G6AUW. Tel Weymouth 786930.

Trio 2200G auto toneburst, nicads, charger, £75. Qwerty keyboard, £15. G4IOK, QTHR. Tel Witney 4867.

Rohde & Schwarz Z-G diagraph, 30-300MHz, good cond, mains lead, test cables, manual, transistor test adaptor, £120 ono. Scope trolley, clean cond, suit Tektronix 547 or similar, £10. G8UJP, QTHR. Tel 073 73 52391.

Radar detector for mobile use, XK Snooper, exc cond, £50 ono. G4KOJ, QTHR. Tel 0332 514462, after 6pm.

SEM Sentinel and 2m converter to 28MHz, mains model, unused, cost £28, accept £14. Codar RQ80 swl antenna tuning unit, as new. £10. G4MTX NOT QTHR. Tel 0780 3604.

Trio 7200G 2m mobile fm tx/rx, 10W, exc cond, used very little, Microwave Modules 144MHz converter, i.f. 4-6MHz, any reasonable offers accepted. Tel Nottingham 234797.

AR88LF, spare set of valves, manual, £40. KP202 2m handheld, helical antenna, leather case, charger, £40. G8EZM, QTHR. Tel Orpington (0689) 30334.

DL2RZ sstv boards psu, case, Pye Lynx camera, 12in bw tv set, £225. FT101 Mk2, III clipper, mint cond, £300. FT221RD, fitted 11 xtals, £300. All carriage extra. G3GRX, 16 Monnington Way, Penrith. Tel 0768 64890.

FDK Quartz 16 2m fm tx/rx 1W/10W, S20-23, R1-7, S0, mic, mobile mount, exc wkg cond, orig packing, prefer buyer collects, £87 ono. G4AXO, QTHR. Tel Winchester 64665.

Morse code key, up/down, Air Ministry type F, adjustable tension, gap, £4 post paid. Valves: VT104 (PT15) for T1154, offers. Transformer, USA 230V, 115V input, 235-0-235V, 200mA, 6·4V, 6·7A, 5V, 4A, £4. Others. G3MBL, QTHR. Tel 01-445 4321.

Atlas 210X, good cond, mobile mount, etc, Atlas 206 digital vfo, gives Atlas new bands etc, £100. Will exchange both for FT7B and digital readout. Consider FT7 with FL110. Tel Raymond, 01-958 3639, after 4pm, anytime weekends.

Electronic organ, Wurlitzer, roll desk top, vgc, cost new, £950, £550. G3NZY, QTHR. Tel York 55491.

Trio TS120S, £320. Icom 260E 2m multimode, £270. Mirage B108 2m 80W linear, £70. All equipment vgc. G8SER, QTHR. Tel 07737 67846.

Exchange: Singer programmable punched card Memomatic knitting machine, used twice, immac, will delight the xyl, for 2m synthesized rig. Daiwa Search 9 2m rx, some xtals, immac, £29. G4GQL, QTHR. Tel 01-518 5162.

FT207R synthesized handheld, all orig packing, handbook, unused case, charger, vgc. G4MBZ, QTHR. Tel 0252 516637, evenings.

Yaesu FT7 tx/rx, 80-10m mobile/base station, superb cond, orig packing, mic, £230 ono. Icom IC3PE psu, 12V, 3A, vgc, £30 ono. G4DFS, QTHR. Tel 0226 790043.

Communications rx B28 set, 60kHz-30MHz, a.m., ssb, perfect cond, wkg order, recently overhauled, some spare valves, ideal for the dx beginner, £40. G6ABX, QTHR. Tel Clacton 31435.

TS520S, xtal filter, mint cond, £375 ono. DS1A, dc unit, £30. G3XHK, 9 Wensleydale Gardens, Hampton, Middx TW12 2LU. Tel 01-979 8779.

TR2300 2m tx/rx incl battery charger, batteries, fitted reverse repeater, £93. Tel Sheffield 57184, after 6pm.

Toolkit chip for PET, £12. Candler typewriting course, £6. *Wanted:* Thruline elements, lopass filter, msf clock, a.f. sig gen, FT901 a.m. filter, pair 10GHz tx/rxs, lcr bridge, old tones rtty tu, 70-200mm zoom, microscope accessories. G3AZI, QTHR. Tel Preston 37815.

Icom IC251E, used few hours only, must go, £350. Catronics rtty terminal CT100 and CD300, vdu, modulator, £175. GW4ACO. Tel 0492 55240.

Vero caseframes KM4C, 233mm wide, 143mm high, 239mm deep, full width modules, front panels are new, module rear panels and pierced with four 1in holes, £14 each. Pair white wightraps, £5. Prices include postage. G4BEZ, QTHR. Tel Cheltenham 583628.

Collection modern mint British stamps plus mint Israeli and old French German used, high catalogue value, housed modern stock album value, £100 and exchange general coverage rx. *Wanted:* 144MHz equipment, vertical hf antenna or w.h.y? Details G3OAZ, QTHR. Tel 0256 65126.

T1200 1-4W handheld available RSGB members only. Visiting USA with FCC licence, 5kHz steps, 10 memories, 143/9MHz charger, also particulars. G3MIZ, QTHR. Tel Bruton 2473.

Want FT1 so must sell FT901DM, used with transverter, only £600. FV901DM, £176. YO901P, £233. FC301, £90. FTV901R(2), £202. 4m, £65. 6m, £52. 70cm, £133. Orig packing, leads, books. All ono. G3BKL, QTHR. Tel 0958 862489, evenings after 7pm.

TS120V, TL120, MC50, £365, or separate. Datong clipper, £20. FT101E, spare NEC pas, offers. Grado F3 stereo cartridge, £10. All good cond, orig packing, etc. G4JTE, QTHR. Tel Pete, 0384 295824.

WANTED

Valve base for 4CX1000A. Emiac SK810 or similar with SK806 chimney if possible, new or used, good price paid for right article. G4KUX, QTHR. Tel 0956 2542.

Valves type BW1121J, ESA1500, recs D94 or equiv as used in rf industrial induction heating machines. G3SMK, QTHR. Tel Earlswood (Warks) 3423, after 7.30pm.

For the Wireless Museum: old radio magazines, catalogues, books, QSL cards, service sheets, valves etc. Specially wanted: pre-war Gamages catalogue, info on Minimitter Mercury 200. Details please to hon curator, G3KPO, QTHR. Tel Ryde (0983) 62513.

Base and chimney type SK600 or similar, suitable for vhf use, 4CX250. GM3TAL, QTHR.

Yaesu FT200/FP200, must be in first class cond, comp with mic, manual, etc, preferably in orig packing. RS48253. Tel Stan, Bedford (0234) 771549.

Circuit information or diagram for Pye Cambridge tx/rx. Modification information for 2m. Tel Andrew Wright, 0532 827203, after 4pm.

29 and/or 146MHz tunable rx for Oscar and Uosat reception only. G8APX, QTHR.

Trio AT230 antenna tuning unit. Will collect or pay Securicor. Taylor, G4EBT, QTHR. Tel Rotherham (0709) 70021, after 6pm or weekends.

SSB filter at 6,200kHz. G3GAD. Tel Orpington 33408.

HF linear, good cond only. Remote vfo, suitable TS820/830. All letters will be answered. Please state price. DJ0VW, Moorkamp 6, 447 Meppen, Gr Fullen, West Germany. Tel 0475 42047.

KW109 high power atu. G4ICC, QTHR.

B2 suitcase radio or any other wartime suitcase/spy type radio. Any cond or incomplete welcome. G8VDZ, QTHR. Tel 01-949 2317.

6ft or similar dish, suitable for 12GHz. GU5ZC, QTHR. Tel 0481 54833.

70cm all-mode, mint cond preferred. Video camera suitable Panasonic vcr, home use, colour. Cash waiting. G4IZW. Tel 0632 678828, anytime.

70cm Palm 4, any cond. 10m multimode, any cond. Micro computer, must be neat, comp. English coins, must be first class cond, pre-1940, cash or exchange on all items. W.H.Y? G4KZH, (G8KZH) QTHR. Tel 021-550 9324.

1kW dummy load, not oil-filled please. NBP9 nicad battery to fit FT207R handheld. NC3A charger. Cheap, clean RAE correspondence course. RS48819. Tel Keith, Rainham (Essex) 54909, not Tuesdays.

Jaybeam Q4/2M antenna. Sommerkamp TS280FM. Microwave Modules 500MHz frequency counter. 70cm mobile tx/rx. G6CUQ. Tel Astwood Bank 2282.

Circuit and/or info on HRO rx and power supply. Will pay for purchase, or loan to photocopy. G3LBS, QTHR. Tel Wythall (0564) 826072.

Wireless World, bound volumes, for various years. BRS34064. Tel Ballymena 44660.

Up to £220 available for unmodified KW2000B or E, ac psu, mic, service manual. I. A. Irving, 25 Woodburn Drive, Leyburn, North Yorkshire. Tel 0969 22160.
Versatower P40, P60 or equiv. Ham 4 or any other heavy duty rotator. G4EGB, QTHR. Tel 0723 62537.
SB400, in good cond. State price. G3JMR, QTHR.
Post Office double current telegraph key, must be in good cond. G3BPE, QTHR. Tel 0474 23372.
Yaesu FT480R, FRT7700, FRV7700C, Bearcat 220FB. Davis, GI6DOS, Fairyhill, Helen's Bay, County Down. Tel Helen's Bay 853642.
CCTV camera, preferably 12V and mains, rf and video out if possible, lens not necessary, must be fairly small, limited shack space. G4IOY, 8 Asmuns Hill, London NW11. Tel 01-455 0540 before 8.30am.
FR50B rx. Kokusai MF45510K filter with certificate and/or xtals for same. Electroniques sm dial SMD2 or Jackson sm dial 4103, both two-speed. GW8UH, QTHR. Tel 0222 485062.
New member needs communication rx, anything would be helpful, but cost is the problem. Please tel 0604 890661.
12AVQ or similar 10, 15, 20 antenna. Drake TR4C, R4C. G4IZG, QTHR.
VHF high band fm tx and/or rx suitable for conversion to 2m, any cond. RS49364. Tel Middlesbrough 594401.
KW Vespa Mk2 with psu, handbook. G4EJT, QTHR. Tel Ted, Great Missenden (2406) 4694.
Racal Mobical 10·7 lsb filter. Datong morse tutor. Channel xtals, ex-Redifon 286 marine radiophones. *For sale:* second world war radio gear, 1155 loop, BC455, BC453, etc. GW8TSP, QTHR. Tel Neath (0639) 820356.
DX302 Realistic rx, must be in exc cond, can collect Lancs/Yorks area. G4JQI, QTHR. Tel 025482 3366.
Marconi sig gen model TF1064A, 68-108, 118-174, 450-470MHz, must be in good clean cond with clear calibration marks. G4IQR. Tel 0203 445880.
Stolle 2050. MuTek 255RD front end. Welz SP400 swr. Rotators KR400C or DR7500X. Jaybeam antennas 5XY/2m, 8XY-70cm. Will collect within 30 miles of Nottingham. G8EVG, QTHR. Tel 0602 861229.
Morse key, LM Ericcson, Stockholm, in good cond. Frank Burton, GI6ELP, 2 Beechgrove Park, Belfast. Tel Belfast 654054 day, 793267 evenings.
Service manuals or any info for Marconi TF966A Q-scan scope. Also for Advance sig gen type E model 2. Postage refunded. G4FQW, QTHR. Tel Accrington 391682, evenings.
Ex-RAF communications rx type R1155(A), comp with mains psu, loudspkr, phone output, must be wkg, in good electrical and mechanical cond. Can collect within radius Bristol, Yeovil, Torquay, Plymouth. G3RDU, QTHR Minehead.
P40 or similar tilt-over tower. G3VQL NOT QTHR. Tel Shrewsbury 55179.
Suitcase or miniature tx/rxs (British, American or Polish), wartime and post-war; any spares, incomplete or damaged sets, orig manuals or associated literature welcomed. RA117E, WS62 with transistorized psu. Army tx No53 Mk2. Taylor, G3UCT, QTHR. Tel Fleet (02514) 6998.
OHMS converter board/03 for Fluke 8200A dvm engineers depth micrometer. Drills, taps, reamers. G3VVB, QTHR. Tel Mevagissey 842368.
FT101/FT101B with cw filter. Pay up to £300. *For sale:* Trio 2300, exc cond, nicads, case, charger, reverse repeater, going hf I hope, £125. G3ZZD, QTHR. Tel 0892 34117
Eddystone technical service manuals for vhf/uhf rx models 770R and 770U to buy or copy. G8MVL, QTHR. Tel 0203 468379.
Matching vfo for Yaesu FTDX401 tx/rx, preferably in good cond throughout, but will consider vfo not wkg if comp. Back issues of *Radio Communication* 1960-80 for club library. G4LUE, QTHR. Tel Barnsley 713417.
Base for TY4500 (B5K). OAP12 germanium photo-diodes. G3VLF, QTHR. Tel Ambergate (077385) 3497.
HF rig, TS520, FT101Z, would consider other models incl TS820S. VHF rig eg FT480R, TR9000. Will reply all letters. G8TUS, QTHR. Tel Derby (0332) 673992.
Collins mechanical filter for 51J4 rx, bandwidth 1·4kHz. Collins part No 522-9030-002. Must be genuine article, offers. Read, G4KCB, QTHR. Tel 0925 72 7749.
Pye Westminster type W15AM rf pcb, part No AT2680720, band 79-101MHz, to repair mobile installation for mountain rescue team. Mike Randall, 36 Newlands Park Valley, Holyhead, Gwynedd LL65 3AR. Tel 0407 741193.
FRDX400 rx, good cond, manual, £100. McWilliam, 24 Heather Close, Stratford-on-Avon. Tel Stratford 68094.
Six-channel converted Vanguard or Cambridge with accessories. Tel Cheslyn Hay (0922) 415351.
Amateur and commercial radio magazines, 1919-25. Auckland, Sandridge, via St Albans, Herts. G8XSG. Tel 0727 55128.

Mobile rallies calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

14 March—Pontefract & DARS Components Fair, Carleton Community Centre, Pontefract. Open 11am. Talk-in, on-site parking, licensed bar, refreshments, bring & buy, RSGB publications, more space than last year. Emphasis on build-your-own. Details from G4AAQ, QTHR, tel 0977 71071.
21 March—White Rose RS Rally, now at University of Leeds. Open 11am. Talk-in on S22 and 432MHz. Details from Richard Hughes, c/o Moortown RUFC, Moss Valley, Alwoodly, Leeds 17.
9 May—Lincoln Hamfest, organized by the Lincoln Short Wave Club, on the Lincolnshire Showground. Details to be announced. Contact J. R. Hunt, G3PVU, c/o the club at the City Engineers Club, Central Depot, Waterside South, Lincoln.
16 May—Swindon & DARC Rally, Park School, Marlowe Avenue, Swindon, Wilts. Open 10am. Talk-in on 144MHz (S22) and 432MHz (SU8 or on GB3TD if possible). Ample car parking, refreshments, attractions for the whole family. Details from K. A. Saunders, G8SFH, QTHR, tel 06668 307.
23 May—The Northern Mobile Rally, The Great Yorkshire Showground, Harrogate. 10am-6pm. Ample car parks; bar; refreshments. Many attractions for the xyl and junior ops. Facilities for the disabled. Lectures etc. Further details from G8KRU, 14 Fieldhead Road, Guiseley, Leeds LS20 8DT. **Please note change of venue.**
23 May—Barry College of Further Education RS Mobile Rally. Barry Memorial Hall. Further details to be announced. Contact R. V. Belcher, GW8TCF, QTHR.
30 May—Plymouth RC Mobile Rally, School Hall, Tamar Secondary School, Paradise Road, Millbridge, Plymouth, Devon. Details from Julie Butcher, G4HKZ, QTHR, tel 0752 338417.
30 May—East Suffolk Wireless Revival, Sports Ground, Ipswich Area Civil Service Sports Association, Straight Road, Ipswich (adjacent Suffolk Show Ground). Attractions include transceiver clinic, antenna testing range, flea market etc. Further details later. Requests for stand space to George Spencer, G6CRN, 83 Tuddenham Avenue, Ipswich, Suffolk, tel Ipswich (0473) 218285. Other enquiries to Jack Toothill, G4IFF, QTHR, tel Ipswich (0473) 44047.
13 June—Elvaston Castle Mobile Rally, Elvaston Castle Country Park, 5 miles south-east of Derby on the B5010. Organized by the Nunsfield House ARC. Opens 10am. Talk-in on 144 and 432MHz. All the usual facilities including full on-site catering facilities. Further details from Ian Cage, G4CTZ, QTHR, tel Derby 71875 or 799452. Trade enquiries to Mr R. Woolley, G4HIJ, QTHR, tel Ashbourne 43241.
13 June—RNARS Mobile Rally, HMS Mercury. Open 10am to 5.30pm. All usual trade stands, and arena events. Talk-in on S22, 432MHz, and 3,660kHz after 0830. Raffle and picnic facilities. Details from A. G. Walker, G4DIU, 103 Torrington Road, North End, Portsmouth PO2 0TN.
20 June—Denby Dale & DARS Mobile Rally, Shelley High School, Skelmansthorpe, Nr Huddersfield. Open 11am. Talk-in on S22 and SU8. Details from J. Clegg, G3FQH, QTHR.
27 June—Longleat Mobile Rally. This will be the City of Bristol RSGB group's 25th event. Entertainment by The Bristol Unicorns Youth Band. There will be a mast erection contest, involving teams of four entrants, the winners of which will be awarded the "Longleat Trophy" presented by Lord Christopher Thynne. President of the RSGB will be attending. Preliminary enquiries for trade stands to, and further information from, B. L. Goddard, G4FRG, tel 0272 848140.

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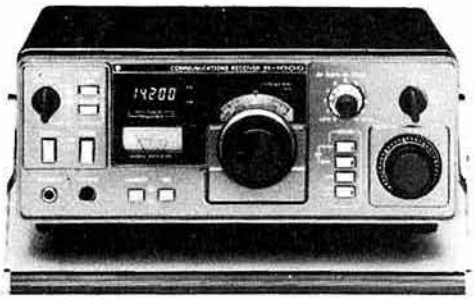

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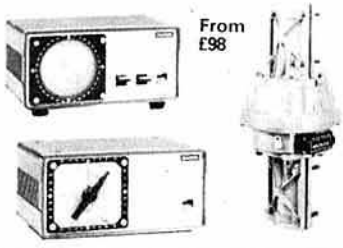

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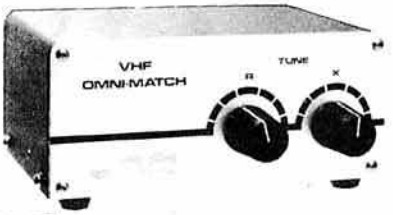

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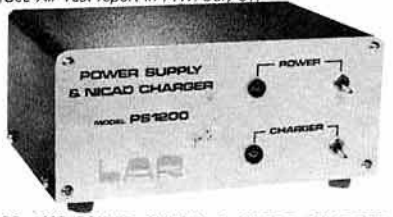

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IC255E	25 watt FM 2m mobile with memory and scanner	£255.00
IC2E	2m FM hand portable	£169.00
NEW!	IC290E 2M all mode mobile	£366.00

NOTE: (i) All prices include VAT
(ii) Securicor delivery arranged if required.

LAR

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60 Green Road, Meanwood, Leeds LS6 4JP
Tel: (0532) 782224

HOW TO BUY!

By post – or 'phone your Barclaycard, Access or LAR Creditcard number. Alternatively, call in for a chat. The shop is just 10 minutes from Leeds City Station and there's easy parking if you travel by car.
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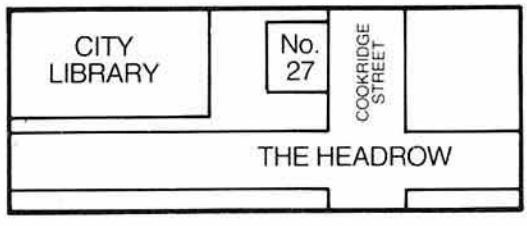

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- Optional power packs available
- Light weight only 450gms
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- Full range of accessories available

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2 METRE MOBILE

- Features two vfo's
- 25/5kHz steps switchable
- Multi scanning functions
- 25W RF output
- UP/DOWN repeater shift
- Remote scan from mic.

Come and try one soon

£259.00 inc VAT and carriage

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2 METRE MULTI-MODE
Too many features to mention but it has just about everything: two vfo's, priority channel, 1kHz/100Hz steps on SSB, 5/25kHz steps on FM, plus and minus 600kHz for repeater use, full scanning on the front panel or microphone.

£366.00 inc VAT and carriage

IC730

80–10m MOBILE

The 730 is an excellent hf rig with dual vfo's and a 100W PA stage, the receiver is superb using an up-conversion system – so don't delay, come in and see it today.

£586.00 inc VAT and carriage

STANDARD

C58

2 METRE MULTI-MODE
The C58 has all the features possible on a portable rig many of which some mobiles don't have. Its optional accessories allow it to be used in the car with a power output of 25W. Come in and compare this with the FT290 you may be glad you did.

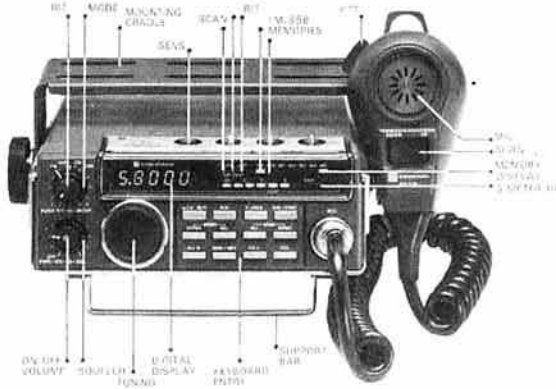
£245.00 inc VAT and carriage

C78

70cm FM PORTABLE
This has all the features of the C58 and uses the same range of accessories (with the exception of the linear amp) so you only need buy one set for both units. With 70cm getting more popular come in and try one.

£225.50 inc VAT and carriage

NEW! C5800



The ultimate in a multi-mode 2 metre mobile transceiver with the built in standard reliability that makes them a winner. For full details give Norman a phone, send for details, or, better still, pop in and try it.

!! PRICE TO BE ANNOUNCED SOON !!

A HAPPY NEW YEAR TO YOU ALL

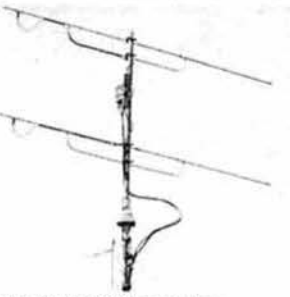
THE 2m switched preamplifier

muTek limited's SLNA144s is the better alternative to the previous generation of in-line, rf-switched 2m preamplifiers

- **Low noise**
  Noise measure of 1·2dB typical
- **Gain:**
  15dB typical
- **Bandwidth:**
  144-146MHz ± 1dB, more than 45dB rejection at 130 and 160MHz. Compare this with the older generation!
- **Power Handling:**
  100W through power
- **Advanced switching control:**
  - rf sensing with switch selectable 'fast' and 'hang' modes!
  - single line 'ground to transmit' control for hard-switched applications—eliminates annoying relay noise experienced with other amplifiers!
  - rf overide of hard-switching function to prevent expensive accidents!
  - straightthrough operation with power off. Failsafe!
- **Power and control connections:**
  via feedthrough capacitors—minimises supply-line pick-up and noise problems.
- **RF connectors:**
  50Ω BNC
- **Case:**
  Diecast, size 50 × 100 × 25mm (excluding connectors)
- **Plus internationally acclaimed muTek quality!**

Price: £33.90 (p&p 60p) inc VAT
Delivery: ex stock

GET MORE UP WITH DL6WU YAGIS



2 × 16 elements for 432MHz providing: approximately 19dBi gain (genuine!) for *only* 210N (22kg) windloading at 160km h⁻¹!!

With DL6WU yagis from Hamburger-Antennen-GroBhandel you can obtain more real antenna gain per unit windload than with any other 'competitive' vhf/uhf yagi range. By the use of advanced mechanical engineering concepts and materials the strength isn't compromised however, and with HAG's unique 3-year guarantee against structural damage due to corrosion you won't see your antenna investment fade away.

The range

MHz	Length (m)	Eles	3dB beam-width° horiz.	3dB beam-width° vert.	Windload N at km hr 120	Windload N at km hr 160	Gain dB	Weight kg	Price £
144	1·04	4	55	70	15	26	9·7	0·45	**18.00**
144	2·75	7	44	51	35	63	12·3	0·98	**22.00**
144	4·91	11	35	38	83	147	14·5	2·20	**36.50**
144*	6·72	13	31	33	160	285	15·6	3·70	**55.00**
432	1·55	10	36	40	22	39	14·3	0·68	**30.00**
432	3·10	16	28	30	59	105	16·5	1·69	**33.50**
432	5·06	23	24	25	91	160	17·9	2·10	**38.00**
1296	2·00	26	20	21	42	–	18·1	0·82	**POA**
1296	4·00	48	15·5	16	135	–	20·6	1·41	**POA**

Prices include precision teflon balun where appropriate, but not VAT or carriage.
* This antenna has 8mm dia elements and a 20mm square boom.

Carriage: 2m 4-element £1.50. All others £4.50. This price reflects the cost of shipping the long packages necessitated by HAG's insistence on not compromising structural integrity for ease of shipping.

We now have a new application note on antennas and their gains: an SAE with a request for ANO9-81 will bring a copy.

A New Year; traditionally a time of hope and renewal. At muTek, we've been working very hard to bring you some exciting new products which we will be revealing over the next few months. These include an expanded range of 432MHz preamplifiers, and a broad-band fet preamp with excellent dynamic range qualities intended for scanning receivers.
There is much more in the pipeline: to coin a phrase—"Watch this space!!" *Stephen (G8KQB).*

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	L(M)	W(kg)	
50MHz			
5 element†	3·5	3·2	£31.74(a)
144MHz			
4 element	1·37	0·5	£14.43(a)
9 element fixed	3·30	1·9	£17.14(a)
9 element portable	3·30	1·7	£19.40(a)
9 element crossed	3·50	2·0	£31.68(a)
13 element portable†	4·50	2·5	£30.22(a)
16 element fixed	6·40	4·4	£35.19(a)
435MHz			
19 element	3·20	1·1	£20.13(a)
19 element crossed†	3·30	1·8	£33.36(a)
21 element	4·60	2·6	£28.87(a)
21 element ATV	4·60	2·6	£28.87(a)

†Denotes 50Ω ONLY – all others 50Ω OR 75Ω

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(a) £4.00. (b) £1.60. (c) £1.40. MAINLAND ONLY

	L(M)	W(kg)	
144/435MHz			
Oscar Special 9 & 19 element†	3·3	2·0	£33.36(a)
1,296MHz			
23 element†	1·64	0·9	£28.75(b)
4 × 23 element antennas – power splitter – stacking frame			£161.46(a)
135MHz Satellite			
9 element crossed	3·5	1·8	£35.67(a)

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4 × 1 metre **£15.96(a)**. 3 × 2 metre **£19.15(a)**
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Attenuation per 100ft. 144MHz-0.8dB. 435MHz-1.6dB. 1296MHz-2.9dB.
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IC290	369
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PROJECT	CODE	ASSEMB'D	KIT
4M EQUIPMENT			
FM Transmitter (1·5W)	4FM2T	34.75	21.20
FM Receiver	4FM2R	61.65	42.15
70cms EQUIPMENT			
Transceiver Kits and Accessories		£	£
FM Transmitter (0·5W)	70FM05T4	38.10	23.10
FM Receiver	70FM05R5	68.25	48.25
6 channel Transmit Adapter	70MC06T	19.85	11.95
6 channel Receive Adapter	70MC06R	27.15	19.95
Synthesiser (2 pcbs)	70SY25B	84.95	60.25
Synthesiser Transmit Amplifier	A-X3U-06F	27.60	17.40
Synthesiser Modulator	MOD 1	8.10	4.75
Bandpass Filter	BPF 433	6.10	3.25
PIN RF Switch	PSI 433	9.10	7.75
Converter (2M or 10M i.f.)	70RX2/2	27.10	20.10
FM Package 1 (Crystal Controlled)	70PAC1	135.00	100.00
FM Package 2 (Synthesised)	70PAC2	163.00	128.00
TV Modulator (for 70FM05T4)	TVM1	8.10	5.30
Power Amplifiers (FM/CW use)			
50mW to 500mW	70FM1	12.05	6.85
500mW to 3W	70FM3	19.65	13.25
500mW to 10W	70FM10	30.70	22.10
3W to 10W	70FM3/10	19.75	14.20
Combined Power Amp/Pre-Amp (10W)	70PA/FM10	48.70	34.65
Pre-Amplifiers			
Bipolar Miniature (13dB gain)	70PA2	7.90	5.95
MOSFET Miniature (14dB gain)	70PA3	8.25	6.80
RF Switched (25W max)	70PA2/S	21.10	14.75
2M EQUIPMENT			
Transceiver Kits and Accessories			
FM Transmitter (1·5W)	144FM2T	36.40	22.25
FM Receiver	144FM2R	64.35	45.76
Synthesiser (2pcbs)	144SY25B	78.25	59.95
Synthesiser Transmit Amplifier	SY2T	26.85	19.40
Bandpass Filter	BPF 144	6.10	3.25
PIN RF Switch	PS1 144	9.10	7.75
Synthesised FM Package (1·5W)	144PAC	138.00	105.00
Power Amplifiers			
1·5W to 10W (FM) (No Changeover)	144FM10A	18.95	13.95
1·5W to 10W (FM) (Auto-Changeover)	144FM10B	33.35	25.95
1·5W to 10W (SSB/FM) (O/P Changeover)	144LIN10A	26.80	19.87
1·5W to 10W (SSB/FM) (Auto Changeover)	144LIN10B	35.60	26.95
Pre-Amplifiers			
Low Noise, Miniature	144PA3	8.10	6.95
Low Noise, Improved Performance	144PA4	10.95	7.95
Low Noise, RF Switched	144PA4/S	18.95	14.40
SYNTHESISER ACCESSORIES			
10-channel Scanner	PROSCAN 1	23.70	15.56
Display Decoder/Driver	DISP1/2	22.60	16.10
GENERAL ACCESSORIES			
Toneburst	TB2	6.20	3.85
Piptone	PT2	6.90	3.95
Kaytone	PTK1	8.20	5.95
Economiser	BE1	4.80	3.50
Regulator	REG1	6.80	4.25
Solid State Supply Switch	SSR1	5.80	3.60
Microphone Pre-Amplifier	MPA1	5.40	2.95
Noise Filter	SLF1	5.95	4.40
Reflectometer	SWR1	6.35	5.35
CW Filter	CWF1	6.40	4.75
TVI Filter	70FI6P	4.20	3.40
MICROWAVE PROJECTS			
Microwave Drive Source	MD05T	29.50	20.40
Bandpass Filter	BPF 384	5.10	3.25

All prices include VAT at the current rate. Please add 70p to your total order for post and handling. Kits contain all pcb components but no external hardware. Crystals are not supplied for transceivers but are for converters, synthesisers etc. Kits when stock are 2-3 days, otherwise up to 28 days depending on component availability. Assembled modules 20-40 days depending on stock. Non-amateur frequencies can be supplied for assembled modules but we reserve the right to charge up to 20% excess to cover handling costs. All postal enquiries require an SAE please; a large one if full lists are required! *Non-technical enquiries only* can be taken 10am-4pm on 07356 5324. For technical information please call 07356 5324 or 0256 24611 between 7pm-9pm, as we are part-time.

Kits are available from the following agents:-

Amateur Radio Exchange, Northfield Road, EALING. 01-579 5311.
J. Birkett, 25 The Strait, LINCOLN. 0522 20767.
Darwen Electronics, 13 Thorncliffe Drive, DARWEN, Lancs. 0254 771 497.
United Trading AB, Box 16024, 200 25 MALMO, SWEDEN. 040 94 89 55.

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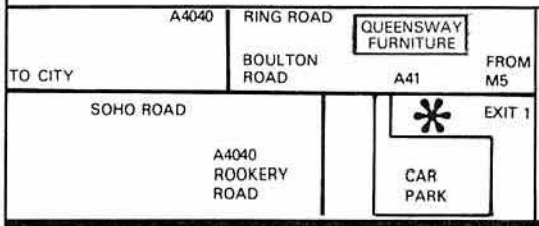

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TS280FM

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FT902DM POA
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FT277ZD MkIII (top right)
Now from Sommerkamp comes the latest version of the renowned FT101—AM/FM option, notch filter, audio peak filter, variable bandwidth—UNBEATABLE VALUE. FM **POA**; AM **POA** including tan, CW filter, microphone

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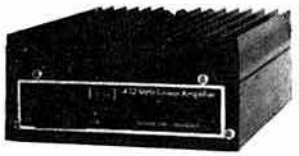

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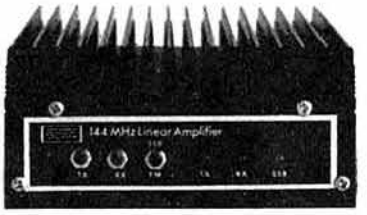

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